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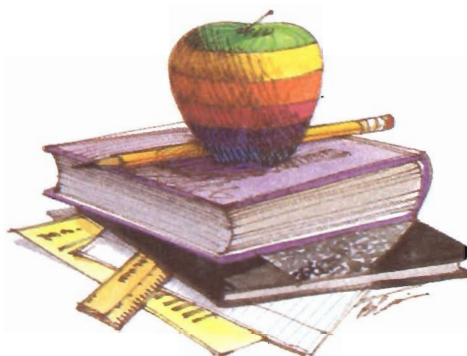
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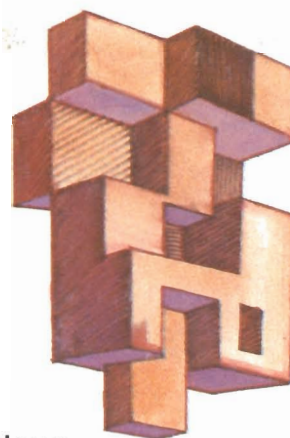
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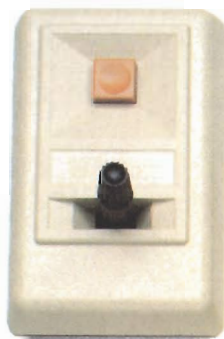


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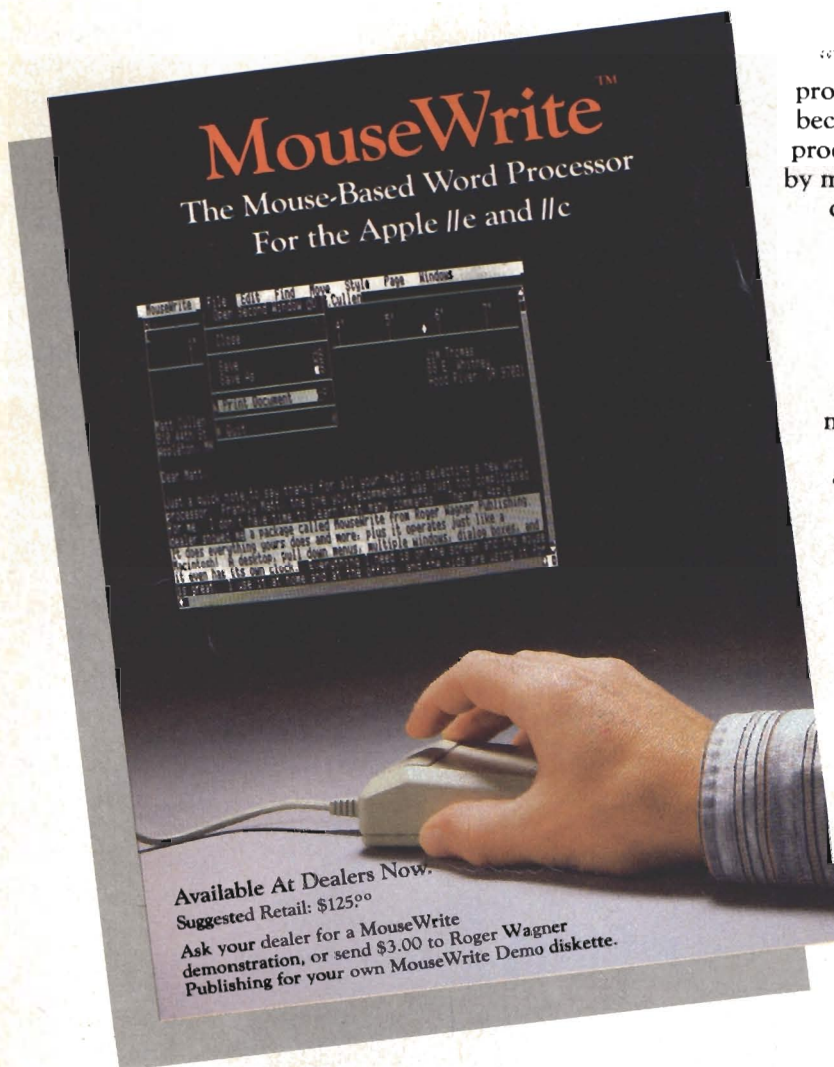


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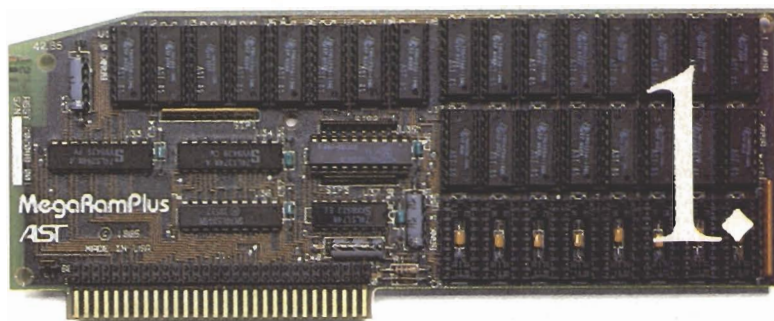
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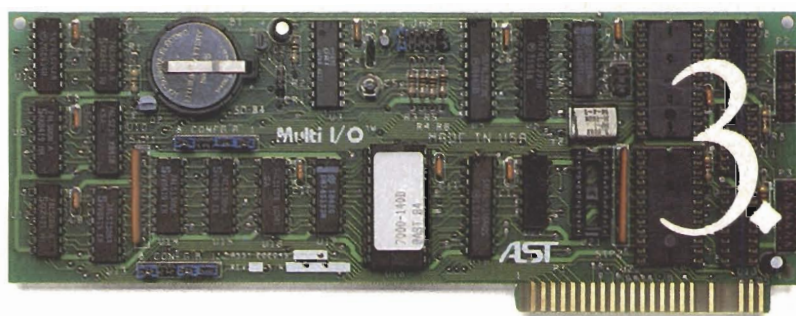
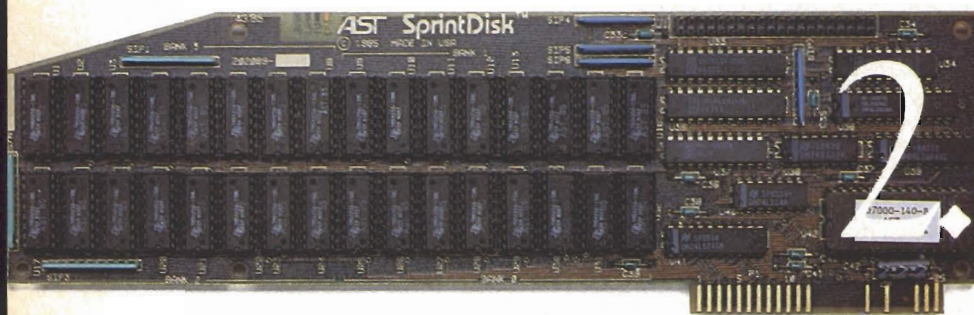
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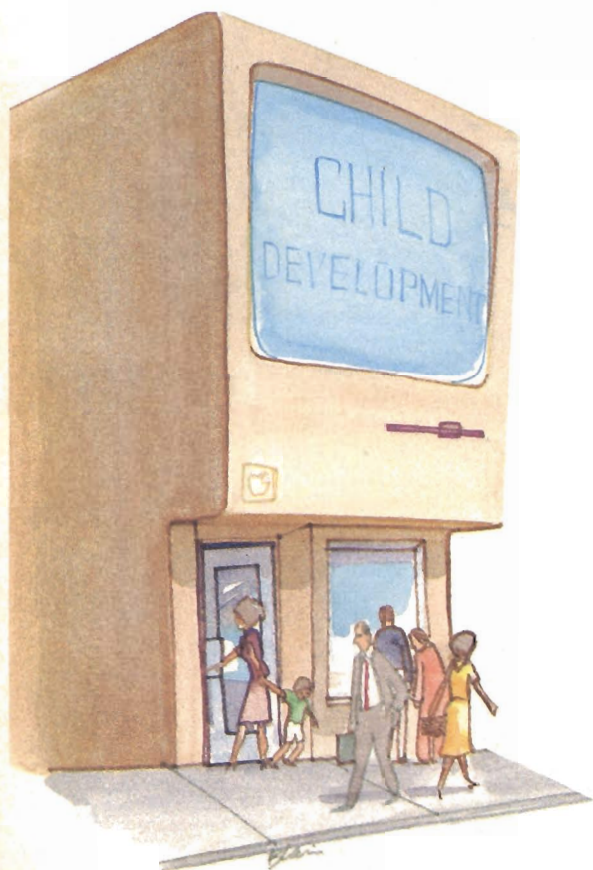
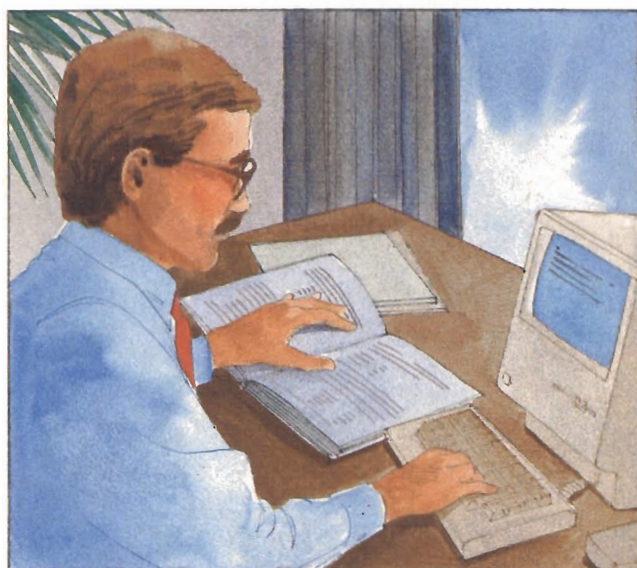
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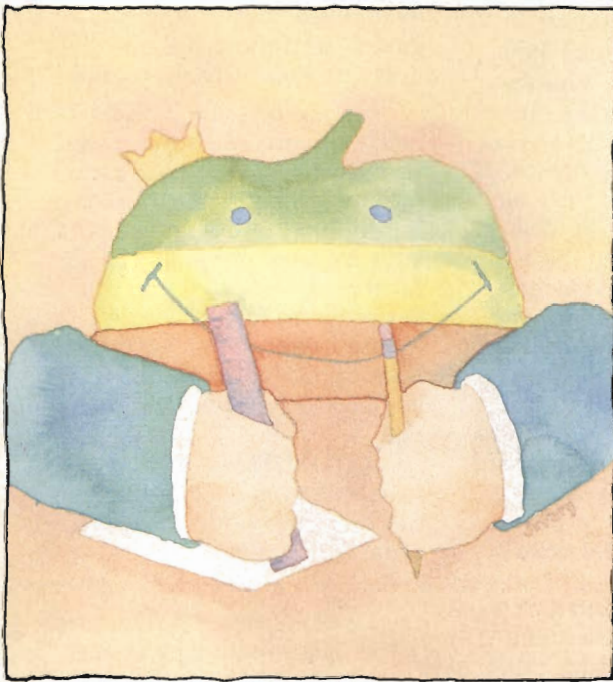
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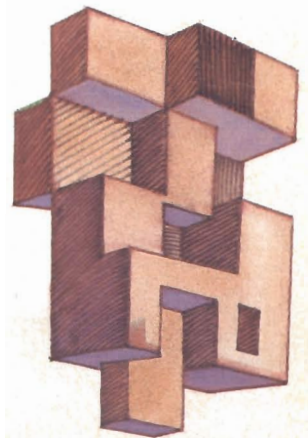
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Editor's Notes

This issue's notes are written by
Gregg Keizer, Apple Applications
Special editor.

—Robert Lock, Editor In Chief

It's not hard to notice that Apple's on the move. Recent product announcements—for both the Apple II line and the Macintosh—more than demonstrate the staying power of the former and the continuing evolution of the latter.

The introduction of powerful Apple II software which uses a Macintosh-like interface, or which demands more memory or disk space, has re-established the Apple IIe and IIc as viable business computers and flexible home machines. The new Macintosh Plus includes more memory, larger disk capacity, and perhaps most importantly, a port allowing up to seven peripherals—including hard disk drives—to be daisy-chained to the computer. A new printer, the ImageWriter II, offers color printing.

Future plans are hinted at by John Sculley, Apple's president and chairman of the board, in our interview in this issue. Network capabilities for the Apple II; file sharing between the II and the Mac; and enhanced graphics, sound, and speed for the Apple II are just some of what may be in Apple's eye.

This third issue of *COMPUTE!'s Apple Applications Special* provides the information you need to make intelligent decisions when considering the flood of

new products. "It's New II" and "MacAdds: More for the Macintosh" highlight a number of the new hardware and software packages from Apple and third-party manufacturers. "Off the Beaten Software Path" takes a look at some of the more unusual, and overlooked, software. Buyer's guides list almost 200 new business and educational programs.

As always, you'll find a lot inside to entertain and inform you. Ready-to-type-in programs—including our first for the Macintosh—put useful software at your disposal. Programs range from a sophisticated personal ledger program for the Apple II to a mouse cursor editor for the Mac. Each application, utility, or game is thoroughly tested and ready to use.

COMPUTE!'s Apple Applications Special is your resource to the changing world of Apple personal computers.

The Fall/Winter *Apple Applications Special* will emphasize Apple computers in education. We're looking for reader feedback on how you, or your child, use an Apple computer at school. Send us your most interesting educational experience, whether fascinating or frustrating, and we'll try to include it in the issue. Address it to the Editor, *Apple Applications Special*, 324 W. Wendover Avenue, Greensboro, NC 27408.

All the Apple II programs in this issue are available on our companion *Apple Applications Special Disk*. This 5¼-inch disk, formatted for both DOS 3.3 and ProDOS, runs on any Apple II+, IIe, or IIc. You can order this disk (\$12.95 plus \$2.00 shipping and handling) only through *COMPUTE!* Publications, either by using the card bound in this issue, or by calling toll-free 1-800-346-6767 (in New York, 1-212-887-8525).

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'86 Apple

Courtesy of Apple Computer, Inc.



An Interview With John Sculley

No one better personifies the new spirit and direction of Apple Computer than John Sculley, the company's forty-seven-year-old president, chairman of the board, and chief cheerleader. Following a remarkable year of internal reorganization and product development, Sculley and Apple have emerged in 1986 with an exciting array of new products. Reflecting Sculley's management style, the company also has a new lean corporate structure, clearly defined marketing plans, and an apparently renewed self-confidence.

For Apple, 1985 was a time of high drama and altered expectations. Most unsettling was a major reorganization of its executive staff—including the resignation of the company's mercurial cofounder Steven Jobs, who lost a widely publicized political battle with Sculley for control of the firm. Ironically, it was Jobs who went to great lengths in 1983 to entice Sculley away from PepsiCola, where he had gained the reputation of a marketing wizard.

After Jobs resigned, Sculley began altering the company's structure and goals. He united the competing Apple II and Macintosh groups into one division to encourage cooperation within the company and streamline Apple's marketing structure. In addition, Sculley pushed for the speedy completion of new products for both computer lines. In the meantime, Jobs established his own computer

company, Next Inc., and hired away several former Apple employees. Apple subsequently filed suit against its founder in an attempt to forestall Jobs' new venture from using what Apple claims may be confidential information for new product development. That suit, settled out of court, gives Apple the right to inspect Next Inc.'s computer to determine if it uses certain proprietary technology, and prevents Jobs from releasing the machine before July 1987.

In mid-January, Apple Computer co-sponsored the three-day 1986 AppleWorld Conference in San Francisco, an event designed to attract attention for Apple, inform the public of the many changes at the Cupertino, California firm, and introduce a variety of new products. Among the speakers were Alvin Toffler, John Naisbitt, Alan Kay, Sculley, and—importantly—Steve Wozniak, the other cofounder of Apple who had previously

stepped away from the company after disagreements with Jobs.

AppleWorld was held simultaneously with the MacWorld and Apple II World Expositions. Dozens of companies displayed recently announced products for the Apple II and Macintosh computers. Other major additions to the Apple II family were announced in September 1985, and included a high-capacity microfloppy disk drive, a color monitor, a memory expansion card, and a Macintosh-like user interface. A new version of Apple's popular printer—the ImageWriter II—which uses a four-color cloth ribbon to print in multiple colors, a 20-megabyte hard disk for the Macintosh, and a new 1200-baud modem were also introduced in September.

Apple's new year is off to an impressive start. Despite the fact that the company experienced its first quarterly loss ever in 1985, profits are up for the first quarter of 1986, and the firm plans future new product announcements. The first series of new products was unveiled at the Apple World Conference.

The MacWorld Expo was the premiere of the new Macintosh Plus computer and the LaserWriter Plus printer. The Macintosh Plus contains 1 megabyte of memory (ex-

pandable up to 4 megabytes), a double-sided 800K disk drive, a new 128K ROM which includes a hierarchical file structure, and an SCSI interface that will make it easier for third-party developers to build add-on products for the Macintosh. Owners of 128K or 512K Macintoshes will be able to purchase upgrades of both the new disk drives and logic boards in order to turn their machines into Mac Pluses.

Although Apple announced no new Apple II products at the AppleWorld Conference, Sculley said that a great deal of research and development is taking place around the Apple II. There are persistent rumors of a 16-bit Apple II, which conceivably could be available by the time you read this. The Apple II remains the most popular computer for the education marketplace, and Sculley said that sound and graphics features available on such computers as the Commodore Amiga and Atari ST will eventually be offered on the Apple II.

Perhaps as important to Apple's future as any of the new products is the fact that John Sculley has consolidated his position of power. He joined the company at a time when IBM's impact on rival manufacturers was increasing dramatically.

Apple, which had experienced the spectacular growth rate that turned it into a Fortune 500 company in just five years, had never dealt with the likes of IBM. Sculley had faced an uphill battle while helping to plan PepsiCola's marketing challenge to Coca-Cola. IBM may present an even bigger challenge.

He emphasized Apple's desire to maintain its significant lead in the educational marketplace and to continue to earn the trust of Apple II owners. By introducing a more open Macintosh, he seems to be trying to create the same feeling of camaraderie with Macintosh owners. In fact, a Macintosh with a hard disk takes a prominent place on his desk.

Sculley promised quick delivery of upgrade kits for existing Macintosh owners, to be available through Apple dealers. His intention is to continue improving the product line without alienating buyers of earlier versions.

Following a recent talk by Sculley to financial analysts, he sat down with us to discuss a variety of subjects relevant to the future of Apple and personal computing. His candid comments during our interview, and remarks to his audience of analysts, follow.

Q&A

COMPUTE!: First, what are the prospects for the Apple II family? Was there at some point a shift away from the Apple II within Apple Computer itself?

Sculley: There really wasn't. That was what was popularized in the press, but it was never true inside Apple. The fact that we were able to get the nine products out this past fall—most of them were Apple II products—certainly underscores that. I think the Macintosh tended to get a lot more attention largely because Steve Jobs was chairman at that time and Steve Jobs was the leader of the Macintosh and it was very close to his heart. But the Apple II has always been the long-term mainstay of the

company, and I believe it's going to continue to be an extremely strong product for us.

First, because of this large franchise in education. The Apple II has continued to gain share of the...K-12 market. The very large installed base we have there gives us an obvious loyalty that we intend to support.

COMPUTE!: How will you sell the vitality of the Apple II to the education market?

Sculley: Recently at a speech I gave at MECC [Minnesota Educational Computing Corporation], I outlined some of our plans, and I said that, first, educators could ex-

Apple II products—from Apple—that would include enhancements that would allow the Apple II to grow as technology has allowed other personal computers to grow. That means that there'll be growth paths as far as graphics, color, sound, memory, storage—all of the things that are possible now with personal computers you'll see happening with the Apple II. And I think the significant thing is that it will be very clear before this year is over that no one has to go out and buy any other kind of personal computer because they can't find those features with an Apple II. The Apple II is going to have extremely attractive fea-

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Steve Wozniak
Inventor of Apple Computer

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The second thing is that, just as we are announcing upgrade kits and support for the Macintosh to be able to grow [into] the Mac Plus, you'll see similar types of support for the Apple II family. I think this is going to be especially important to us in education. Educators are going to have the choice to continue buying what they have now, or to be able to buy more enhanced versions of the Apple II if some features are more important to them. They'll have the flexibility to upgrade the Apple II's that are out there to increase these more enhanced features. For the ones who don't have Apple II's, who have II's and II+'s, we'll come up with a program that will make it attractive to them to decide whether they want to grow as the technology grows.

COMPUTE!: Is this a return to supporting the early Apple II community?

Sculley: I think that the kinds of things we're going to be doing on the Apple II will show real support to the people who have been loyal to us from the start. I think it will show a real commitment that Apple is as interested in the Apple II as the Macintosh. As far as education is concerned, I think people will see that we are as committed to bringing systems products into education for the Apple II family as we are to bringing systems products into the business world for the Macintosh. This means we are looking forward to network services that will allow teachers to manage a group of work stations within a classroom. And we are working with educational software developers to develop more curriculum-based software, and taking into consideration that some of the software will be managed in a network environment.

COMPUTE!: Has your view of the Apple II changed?

Sculley: I continue to gain respect for the Apple II. What impresses me is that the Apple II has this incredibly loyal following. The machine is the most reliable of any computer made or sold, and I think no computer enjoys better

word-of-mouth support than the Apple II. One of the reasons that we're bringing the users' clubs

"...Apple is as interested in the Apple II as the Macintosh."

into the AppleWorld is we want to strengthen our ties with them and listen more to their ideas. Part of being a market-driven company means not just listening

to the marketplace that may be buying your product, but listening to the marketplace that's already using it. The user clubs are especially important in terms of support for the Apple II.

COMPUTE!: What is Steve Wozniak's involvement with Apple? What will it be?

Sculley: Contrary to what has been written in the press, Steve Wozniak never resigned from Apple. He has always been and continues to be an employee of the company. Steve has his own company as well, Cloud-9, and he's enjoying it. I like Steve Wozniak very much and respect him a lot, and make sure that he's invited to every important Apple event that we have around here. I think it means a lot to the people of Apple to have one of their founders, Steve Wozniak, who cares about the products and the company as much as he does.

John Sculley On Apple In '86

We are a new-product company in a new-product industry, and we've got to be able to get those products out. We introduced new products in September—peripheral products—all of which have done very well in the marketplace. 1986 will be a very significant new-product year for Apple Computer, starting this month [January, 1986]. We are making major commitments. Products have been defined about three years out. Since I've been at Apple, we've never planned that far in advance as to what our products are going to be.

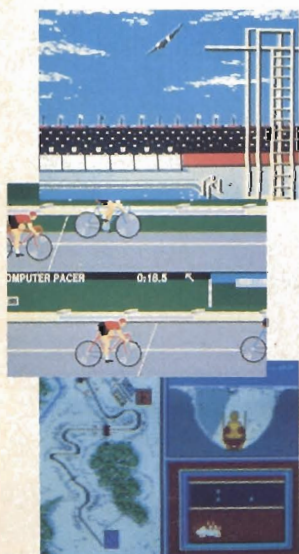
We've got to have the capability of doing VLSI [Very Large Scale Integration—integrated circuits with more than 100,000 transistors on a single chip—Ed.] chip design ourselves. The original Macintosh was done entirely with off-the-shelf components, and some very innovative things were done with those components. You'll see at Apple in the beginning of 1986—and it will be emphasized even more in the future—custom LSI [Large Scale Integration—integrated circuits with between 10,000 and 100,000 transis-

tors on a single chip] design products. This is essential for us to be able to compete with the Japanese, with IBM, and other large companies.

One example of what we're doing right now is we're in the process of purchasing a Cray Computer, their high-end XNP. We want to be able to simulate our hardware products well in advance of when they'll actually be completed so that the software development can begin as early as possible. We went back, for example, and analyzed with Lisa and Macintosh the amount of time that was taken up with optimizing software and hardware when they were matched together for the first time, and it was upwards of a year's time.

Unlike other companies that have pretty well said they'll do what IBM does—I've got a lot of respect for IBM as a company—but we still intend to follow our own path as far as technology is concerned. We think we have some very distinct opportunities which have not yet really been commercialized.

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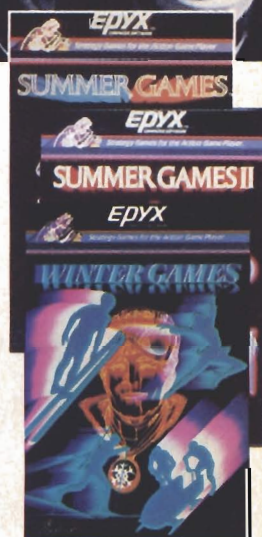
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On Desktop Publishing

We see this as more than a vertical market. We see this as an emerging market which may very well be a very, very significant segment of the personal computer industry in the future. As a perspective, Xerox built an entire company on "xerography," and we think that with desktop publishing—once people can see what you can really do—that it's going to become an increasingly accepted way of putting together presentations, proposals, reports, letters, and what have you in companies of all sizes.

We are not only introducing Macintosh Plus—which becomes an even better text or composition editor for desktop publishing—but we are introducing LaserWriter Plus. LaserWriter Plus goes beyond LaserWriter. It will have, resident inside, 35 typefaces, and I think this will give us an opportunity to emphasize the difference of a LaserWriter versus other laser printers that are really replacements for daisywheel printers.

COMPUTE!: Can he still make a significant contribution other than morale?

Sculley: He is well up-to-date on everything that's going on for the Apple II, which is his primary interest, and he has a close personal relationship with the engineers that work on the Apple II. He was at our last communications meeting. He was at an Apple Expo that we had here. He was at the Apple Christmas party. He is speaking at the AppleWorld event. I'd say that his ties are getting stronger with the company, and I think everybody feels really good about it.

COMPUTE!: Could that ever happen again with Steve Jobs? Could he be brought back into the fold?

Sculley: There are obviously some major outstanding issues that Steve and Apple need to resolve, but I would hope that at some point there's a real chance

for Steve Jobs to feel a part of Apple. He's one of the founders of the company, a great visionary, a great contributor to the industry. So I think it's something we all hope will happen some day. But obviously there are issues that need to be dealt with in the short term first.

COMPUTE!: You talk a lot about alliances with other companies, and the third-party market has always been important to Apple and the personal computer industry. Can you compare that to any other industry?

Sculley: Not in the same way. The after-market sales for automobiles include a whole range of third-party companies that build accessory products, but I don't think anything is as intimate and as significant to the success of products as we find in the personal computer industry. The third-party developer plays an absolutely essential role in the success of any vendor's products, and this is a relationship that I consider a high priority for us.

COMPUTE!: How do you draw the line between what Apple should develop and what products to leave for third-party developers to pursue?

Sculley: I think it becomes a pragmatic, rather than a philosophical decision. If we felt everything was going to be developed by third-party companies, we'd be happy to have third companies do it all. But the fact of the matter is that third-party companies are not always funded to be able to put the development or investment in software or peripheral products that we may consider extremely important to the success of a particular computer that we're trying to sell. In that case, we may choose to bring that product out ourselves, or, with our new venture fund, we may choose to take a position in one of these companies. Not necessarily to control them, but, more importantly, to make sure that they've got a sponsor to help them get important products out.

COMPUTE!: Third-party developers are still very important, then?

Sculley: I would never want to see the company try to replace the role of the third-party developer because so much innovation comes from third-party people. We can create a very innovative machine and the more open we make it, the more inviting it is for the third-party developer to work with it. But a lot of the innovation—whether it was *VisiCalc* in the early days, or *Lotus 1-2-3*, or *Excel*, or many of the new things we're seeing today like *PageMaker* and *Insight*—is being developed by outside companies. I wouldn't want to see that change. What I do think is changing is that, as the industry becomes more market-driven, it's becoming more diffi-

"I would never want to see the company try to replace the role of the third-party developer..."

cult for a third-party developer to start in their garage.

COMPUTE!: You mean hardware?

Sculley: I don't think it's very realistic to expect anyone to start another personal computer company in a garage because the entry costs are too high today. And I think we're starting to see the same thing in the third-party community as well. In that regard, we

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at Apple want to see how we can play a range of roles with third-party people, recognizing that they will probably be fewer in total because you can't start as easily in a garage. And the successful ones are going to have to have more marketing leverage as well as good financing in order to be able to succeed in a more competitive marketplace. These are areas where Apple may be able to make a contribution.

COMPUTE!: The Mac was not as open to third-party hardware developers as the Apple II.

Sculley: But I've stated since the reorganization that that is a very clear direction we're moving in. The Mac Plus—which is expandable—is another step in that direction, and you'll continue to see



*“...you'll
continue to
see Apple
move more
and more
toward open
products.”*



Apple move more and more towards open products. Not to replace our compact products, but rather to expand the product line.

COMPUTE!: One of the things that people at Apple talked about regarding the Mac was the concept of the computer as an appliance. The need to make the Mac more open—does that indicate that the personal computer is never quite going to realize the appliance concept?

Sculley: One of the things that characterizes this industry is that we are always searching for metaphors as ways of describing what it is we're trying to create, often because we're trying to describe it before it actually exists. And so there have been metaphors: The computer as a bicycle for the mind; the computer as a power tool; the computer as an appliance. I'm not sure what the best metaphors are, but I think the clear message that we get from the marketplace is that it wants a general-purpose product that is very adaptable to individual customers' needs. I think that the confirmation that the Apple II has gotten in the marketplace and that the IBM PC has gotten in the marketplace tells me that the more open we can make our products, the more support we're going to get from third-party developers and dealers, and the more flexibility there will be for the end user. And that's why we're moving in that direction.

COMPUTE!: But you have two computers that are not as open as the IIs?

Sculley: We have had a lot of success with the Apple IIc and with the Macintosh, and I think there's a role for both. But I think we've got to have a slot version of a Macintosh as well as a compact, just as we have a slot version of the Apple II as well as a compact Apple II.

COMPUTE!: What is the future of the Apple IIc?

Sculley: The Apple IIc has a good future. It is a product that sells very heavily during the Christmas selling season, and so it is the most seasonally skewed of any of the products that we manufacture. We expect the Apple IIc to be a very long-term member of the Apple II family.

COMPUTE!: Is your goal to have a fully upward-compatible product line, including the II and the Mac eventually?

Sculley: What we want to do is take as many of the look-and-feel features of the Macintosh with the high-resolution graphics and the use of the mouse and the desktop

icons and so forth and be able to bring that into the Apple II environment. At the same time, we want to make it very easy for a user to port files between a Macintosh and an Apple II, so you can read and write in both directions. We also want to be able to have the ability to share peripherals between those products

On Compatibility

I'd like to emphasize the importance of systems products. We believe we've got to reduce the risk of making the choice to go with Macintosh, and we've got to increase the rewards when you do make that choice. The increase in rewards is going to become more and more obvious as you start to see what you really can do with the Macintosh.

Reducing the risk means we've got to have compatibility at the network level, if not at the operating system level, with IBM and other products. So connectivity becomes a key priority for us, and systems products are a very essential thing for Apple to be successful in business. This has probably been the most difficult part of our transition during the reorganization over the last six months.

Apple has not been inherently a systems company. It's a company that started with enthusiasts and built stand-alone personal computers—some really great ones. The orientation towards systems, which means connecting to other people's computers and recognizing what customer needs are and recognizing standards, was a very different orientation from anything Apple had considered before. We have made that transition, and we have already established several relationships with outside companies that are developing products for us. You'll see Apple co-developing systems products, and these products will begin to appear on the market by the beginning of March. And there'll be products coming throughout 1986 and 1987 as well. We believe our goal should be to have as good a systems solution with Apple products in an IBM world as IBM or anyone else has.



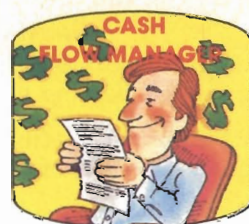
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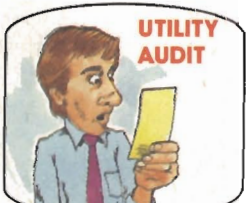
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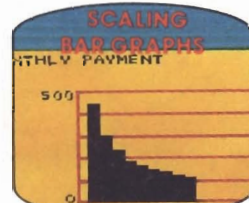
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in the future, and this is something we are working toward.

COMPUTE!: What effect has the reorganization had on these goals?

Sculley: Now that we are one Apple as opposed to two separate product divisions, it has become a lot easier for us to look at the issue of common peripherals

laying off people at Apple for the first time, I think was very difficult. But as the company grew together and as people started to see that it really was a better way to run the company and as people started to see the results and started to see that it was possible to have the same culture only with more process and more disci-

understand better and better what customer needs are and become more solutions-oriented. People aren't just buying technology for technology's sake. I think that a few years ago if somebody had brought out a product like the Amiga or the Atari—when we largely had an industry that was dependent on enthusiasts and where technical features for their own sake were looked at as the reason to buy a product—that those products would have been very formidable. But I think it's a much tougher marketplace now for someone to introduce a product just on technology features alone, even when they may have some very good features.

COMPUTE!: Are you taking specific steps to address the Atari and Amiga computers?

Sculley: We're doing things. Anybody who has a keen interest in sound and graphics and color and the kinds of things which some of these products are focusing on is going to be very well-satisfied with the directions that we'll be going in with the Apple II. In the case of the Macintosh, we have several years' headstart with the human interface that has now established itself as the standard of excellence with the software support. So I think we're now in a position where we can go and pioneer emerging markets like desktop publishing with a functional hardware and software solution as opposed to trying to start from scratch. We do it with the confidence that we are financially extremely strong. I don't think that a lot of people want to take a risk of buying a computer from a company if they aren't sure the company is going to be a strong and healthy company two and three years from now. That's clearly the message we've worked very hard on over the last six months—to let people know that Apple is a very strong company here for the long haul. **aa**

Paul Freiberger is a free-lance writer, former editor with Popular Computing, and the co-author of such books as Fire in the Valley (Osborne/McGraw-Hill) and The Apple IIc: Your First Computer (COMPUTE! Books).

On Telecommunications

We think that Macintosh will have a very big growth opportunity as a communications work station. One of the first strategic alliances for Apple is with Northern Telecom. One of the most important trends is the [merging] of communications and desktop computing. Northern Telecom offers Apple the chance to sell into channels where we have never been before. We think this is the beginning of a relationship where we have a couple of years headstart as far as the interface is concerned, and we're making substantial investments into products well out into the future. Northern Telecom has a significant research capability in telecommunications. We see a very good relationship emerging between our two

companies.

We've been doing research ourselves with Macintosh as a front end to IBM and DEC. We have been developing a product in-house that lets us take the Macintosh and make it a front end to DEC's all-in-one office automation tool, and we've also been working on a front end to IBM mainframes. We think this is an obvious area of growth opportunity for us. By refusing not to follow the line with the MS-DOS operating system, it's obviously important for us to go and build upon the things that are distinctive. Our interface is distinctive not only for the business productivity market, but is also important as a front end for serious and professional users of other computers.

between the products. That's obviously going to take us a year or more to implement. I think all of those steps will give us sort of a fabric to weave these two products together without ever making the operating systems the same, because the operating systems are very distinct from each other. There is no advantage to trying to lock in on a single operating system. It's more important that we find other ways that we can have a relationship between the two products.

COMPUTE!: How has the reorganization affected morale at Apple?

Sculley: I think the reorganization has been extremely positive on the morale of the company. The pain that we had to go through of

pline, the confidence just kept building over the months. As we finished 1985, we finished it on a high, not only from our financial performance, but, equally important, in terms of the feelings of the employees. I think they got their confidence back. The feeling is that it's working well and I think there's a very up feeling throughout the organization.

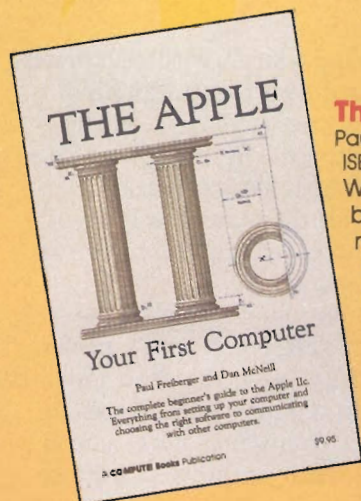
COMPUTE!: What's your view of the competition from the Atari ST and the Commodore Amiga?

Sculley: Competition from other products is something that we will always have. There will always be new products because we are in a very competitive industry. As Apple becomes a more market-driven company, we have got to

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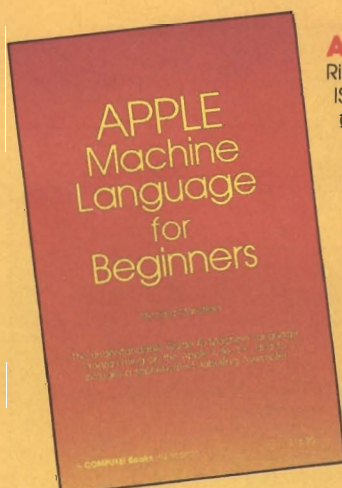


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Buyer's Guide

To Business Software

The flood of business software for the Apple personal computers—ranging from the Apple IIe and IIc to the Macintosh and Mac Plus—shows no sign of slowing. With the recent introduction of the Mac Plus, and the wide variety of memory and storage enhancements now available for the Apple II line, Apple more and more means business.

The 800K double-sided UniDisk 3.5 and megabytes of RAM are breathing new business life into the Apple II-series computers. Applications which would have been unmanageable in a 5¼-inch disk format are now perfectly workable with the increased speed and space of the UniDisk's 3½-inch disks.

The Macintosh continues to make inroads in the traditionally IBM-dominated business mar-

ket. Enormous databases, sophisticated spreadsheets, and easy-to-use desktop publishing applications are just some of what's on the shelves for the Macintosh. The new Mac Plus, with 1 megabyte of RAM, faster operation, a double-sided 800K disk drive, and improved keyboard will only increase Apple's business profile.

This buyer's guide lists just some of the newest programs available for Apple's personal computers. The majority were released between July of 1985 and February of 1986. Since no buyer's guide can be exhaustive, what you'll find here is simply a wide-ranging sample of new business software.

Note that prices and machine availability are subject to change.

The data for this guide was supplied by .MENU—The International Database Corporation. For further evaluative information and ordering, or to insure that your product is included in the database, contact .MENU, 1520 South College Avenue, Fort Collins, Colorado 80524. The toll-free numbers are 1-800-THE-MENU, and 1-800-MAC-MENU, or 303-482-5000 outside the United States. When ordering, note the International Standard Program Number (ISPN).

Product	Price	ISPN	Publisher/ Vendor	Systems	Description
Word Processing					
Doug Clapp's Word Tools	\$79.95	1718-150	Aegis Development	Mac	Text analysis and writing improvement tools which count and sort characters, words, proper nouns, articles, prepositions, sentences, and paragraphs. Spots and corrects common typing errors and checks for improper word usage.
Haba Speller	\$49.95	33987-077	Haba Systems	IIe, IIc	Spelling checker for AppleWorks. Corrects misspelling, displays correct spelling, and even reads AppleWorks files.
MacGAS	\$99.00	31250-300	EnterSet	Mac	Interactive spelling checker—with 80,000-word dictionary—combined with full-length thesaurus. Also includes glossary of commonly-used phrases which can be entered through abbreviations.
MacLightning	\$99.95	72043-500	SoftDesign	Mac	RAM-resident tool for accessing and manipulating data libraries and reference works. Spelling and grammar checker available now. Invisibly watches, then beeps each time an error is made. Other libraries and references to be released.
MacSpell+	\$99.00	20775-500	Creighton Development	Mac	Interactive spelling checker (75,000-word dictionary) available as a desk accessory. Includes thesaurus, and works with Word and MacWrite (2.2 and above).

Product	Price	ISBN	Publisher/ Vendor	Systems	Description
Mastertype's Writer	\$69.95	95709-034	Scarborough	II+, IIe, IIc	Type reports, letters, memos, and notes using your computer just as you would use a typewriter.
Microsoft Word 1.05	\$195.00	53150-751	Microsoft	Mac	An enhanced version of Microsoft Word for the Macintosh, adding new features and high performance with the Apple LaserWriter.
Mouse Word	\$129.95	40218-510	International Solutions	IIe, IIc	Word processing and telecommunications in a Mac-style interface. Allows for mail merge and cut and paste from Mouse Calc. Mouse required.
Perfect Writer/ Speller/Thesaurus	\$139.00	81600-500	Thorn/EMI	IIe, IIc	Package includes a word processor, a spelling checker with a 50,000 word dictionary, and a separate 50,000 word thesaurus.
The Right Word	\$89.00	5531-700	Assimilation	Mac	Double-layered spelling checker—40,000-word dictionary for microfloppy drives; 200,000-word dictionary for hard drives. Compatible with Word, MacPublisher, MacWrite, Jazz, and others.
Sensible Grammar	\$99.95	69200-450	Sensible Software	IIe, IIc	Grammar checker with more than 1,000 commonly-misused phrases to identify faulty writing. Also checks for punctuation, capitalization, and typographical errors. Works with most ProDOS-compatible Apple word processors.
Superscript	\$59.97	63225-490	Progressive Peripherals	IIe, IIc	Combines word processor, spelling checker, calculator and mailmerge facility.
WordPerfect	\$179.00	68012-600	SSI Software	IIe, IIc	Full-feature word processor with onscreen editing, footnotes, macros, headers and footers, and optional (\$30) 50,000-word spelling dictionary.
Word Processor and Data Base Manager	\$49.95	08993-800	Brownbag Software	II, II+, IIe, IIc	Integrated word processor and database. Displays 80 columns without additional hardware.
Spreadsheets					
HabaCalc	\$74.95	33987-047	Haba Systems	IIe, IIc	Mouse/menu-driven spreadsheet, 64 columns by 256 rows, which leaves 46K of memory free for calculations. Cut, copy, paste commands, scroll bars, and mathematical functions.
Mouse Calc	\$149.95	40218-505	International Solutions	IIe, IIc	Spreadsheet and graphics program lets you budget your business, or play "what if." Put together proposals or forecast sales.
Notes for Microsoft Excel	\$89.00	43760-700	Layered	Mac	Installs as a desk accessory, providing online help screens and information for Excel.
PFS: Plan	\$125.00	73300-75	Software Publishing	IIe, IIc	Part of the integrated PFS series, this spreadsheet (70 rows by 36 columns) makes budgeting, forecasting, and planning easy.
SuperCalc 3a	\$195.00	74700-326	Sorcim/ILIS	IIe, IIc	This enhanced version, in UniDisk 3.5 format, supports the Apple II Memory Expansion Card and the ImageWriter II color printer. An integrated spreadsheet, graphics and database program.
Super Crunch	\$295.00	85350-330	Paladin Software	Mac	Enhanced version of Crunch. This spreadsheet application provides for three-dimensional worksheets, additional auditing features, macros, graphics, database, unlimited fonts, improved linking, and the ability to customize icons.
SynCalc	\$49.95	77500-746	Synapse	IIe, IIc	Comprehensive spreadsheet program designed for both home and small business application. Includes variable column widths, vertical and horizontal split-screen capabilities, pop-up menus, and 40- or 85-column displays.
Database Management					
Data Handler II	\$79.00	54725-059	Minnesota Educational	II+, IIe, IIc	Files can be easily edited and reconfigured. Includes a flexible reporter, label generator, and quick-screen scanning feature.
Eurobert Database	\$59.95	79965-250	TDI Software	Mac	A relational database capable of generating full screen input masks and handling advanced file queries.
Factfinder I.1	\$150.00	31152-500	Forethought	Mac	Enhanced version of popular information manager. Not copy protected, works with Switcher and LaserWriter, and allows factsheets sorting within a stack.
File & Report	\$89.95	66525-200	Rio Grande Software	IIe, IIc, Mac	Three managers—file, record, and report—store and retrieve data, and produce reports, lists, and summaries.
Filevision—Business	\$395.00	81077-045	Telos Software	Mac	Graphics-oriented database. For professionals in medium-to large-sized businesses such as corporate planners, analysts, managers, engineers, and more.
Interlace	\$139.00	70663-325	Singular Software	Mac	Relational database with spreadsheet capabilities, this program offers visual database design, powerful report generation, and file length based on disk space, not memory.
OverVUE 2.0	\$295.00	63531-700	ProVUE	Mac	Database program which includes macro capability, charts, relational joining, ability to import data from a variety of sources, and flexible report generation.

Product	Price	ISBN	Publisher/ Vendor	Systems	Description
ProFILER 2.1	\$99.95	61387-600	PM Software	II+, IIe, IIc	Database which can store up to 1500 records on one floppy disk, up to 60,000 on a hard disk. Report generator included. Maximum of 250 fields per form. Not copy protected for easy transfer to hard disk.
Record Holder	\$49.95	72775-675	Software Discoveries	Mac	Full-function database with variable-length fields, easy formatting, flexible search features, and quick report designing and printing.
TimeBase 1.6	\$149.95	72043-700	SoftDesign	Mac	Combines time, database, and deadline management, along with simple word processing, for scheduling and planning.
Finance and Job Costing					
Arch Account Ver. 1.0	\$295.00	32318-020	The Gardner Partnership	Mac	Provides job costing and client billing based upon percent of construction cost, professional fee, or personnel expense.
Excalibur Plus: Job Costing/Work in Progress	\$695.00	05306-245	Armor Systems	IIe	Prepares a work order estimate, posts estimate date to it, and transfers the estimate into an actual work order at any later date.
Puzzle 512 Ver. 1.0	\$235.00	41662-700	JLC Software	Mac	A stand-alone, totally integrated comprehensive financial planning system designed for business.
Quicken	\$79.00	40562-700	Intuit	IIe, IIc	Prints checks to pay bills, tracks spending, and verifies bank balance. Data can be transferred to <i>AppleWorks</i> spreadsheet. Program uses many of the same keystrokes and displays similar menus as <i>AppleWorks</i> .
Smart Money	\$79.95	69925-257	Sierra Online	II, II+, IIe, IIc	Comprehensive financial package for tracking all assets and liabilities.
Work Force II	\$39.95	19784-900	Core Concepts	II, II+, IIe, IIc	Six menu driven financial packages including loan analyzer, savings and wage analyzer, calculator, line writer, and check balancing.
Stocks and Taxes					
Equalizer	\$199.00	68131-325	Schwab Technologies	IIe, IIc	Designed to give you the chance to make informed trading decisions and to carry them out as quickly as the pros do.
EZTAX-Plan	\$95.00	30578-200	EZ Ware	IIe, IIc, Mac	Automatically computes tax according to tables or schedules, alternative minimum tax, self-employment tax, and more.
Investment Manager	\$29.95	59937-380	PBI Software	IIe, IIc	<i>AppleWorks</i> template summarizes stocks, mutual funds, bonds and CDs.
MacInTax 1985	\$75.00	74106-500	SoftView	Mac	Sophisticated tax preparation and planning program which displays IRS forms on the screen and prints all data onto blank paper. The only IRS-approved dot-matrix printout of the 1040 form. Forms and schedules automatically linked, itemizations of any amount, and the entire IRS booklet available online.
Taxease	\$59.95	41400-290	L. W. James & Assoc.	Mac	Individual federal income tax spreadsheet templates for comparison and preparation of tax returns and tax planning.
Accounting					
Accountant	\$29.95	59937-100	PBI Software	IIe, IIc	Keeps track of all monetary transactions. All deposits and disbursements are clean and organized.
Accountant, Inc.	\$199.95, \$299.95 (Mac)	72240-050	Softsync	IIe, IIc, Mac	Includes a general ledger, accounts receivable and payable ledgers, sales, purchase, receipts, payments, and general journals.
Accounting Plus/Accounts Payable	\$495.00	46859-051	Manzanita	IIe	The accounts payable subsystem is designed to provide the user with instant accessibility to cash flow position.
Accounting Plus/General Ledger	\$495.00	46859-054	Manzanita	IIe	The core module for <i>Accounting Plus's</i> totally integrated and menu-driven automatic accounting system.
BusinessWorks	Price varies	46859-250, 220, 200, 210, 230	Manzanita	IIe, IIc	A full-featured accounting system in Apple's UniDisk 3.5 format. Looks and acts like <i>AppleWorks</i> . Financial information can be transferred to <i>AppleWorks</i> spreadsheet and database files. System Manager (\$95—required), General Ledger, Accounts Payable (\$395), Accounts Receivable (\$395), Inventory Control (\$395), and Payroll (\$445) modules available.
Insight General Ledger	\$575.00	43760-650	Layered	Mac	A fully integrated system. Entries into accounts receivable or accounts payable automatically update General Ledger.
Plains and Simple	\$695.00	33475-850	Great Plains Software	Mac	Accounts receivable, accounts payable, and general ledger in familiar one-write format. Cash-flow calendar, sample charts of accounts, online help and two dozen reports.
Rags to Riches: General Ledger	\$199.95	12200-770	Chang Labs	Mac	Double entry general ledger module which is used as the core of an integrated accounting system.
ShopKeeper	\$49.95	69805-630	Woodtec	Mac	Integrated BASIC program consisting of accounts receivable, billing, inventory, invoicing, and point of sale. Screens look like paper forms businesses now use. Microsoft BASIC 2.0 or above required.

Product	Price	ISBN	Publisher/ Vendor	Systems	Description
Fonts and Graphics					
Colormate	\$125	56400-475	NEC Information Systems	Mac	Creates color text and graphics with the Macintosh. Colors <i>MacPaint</i> text and graphics or text and graphics pasted from other applications. NEC P560XL or CP2/CP3 color dot matrix printer required.
FullPaint	\$99.00	90343-375	Ann Arbor Softworks	Mac	A full-screen, four document painting program for the 512K Mac and Mac Plus. Upwardly compatible with <i>MacPaint</i> , this application offers new features such as rotating, skewing, and distorting to produce true 3-D graphics.
InMotion	\$139.95	90343-125	Ann Arbor Softworks	Mac	Professional display and design tool for the creation of full-screen animation and movies of any length. Graphics/animation tools, clip-art collection included.
MacFont 1	\$29.95	95763-450	Suncom	Mac	Collection of new Macintosh typefaces, ranging from Lilliput 9 (very small) to Pasadena (pen-like).
The Prime Plotter	\$240	62062-100	PrimeSoft	II+, IIe	Sophisticated plotting and charting software which allows for user customization. Pie charts, bar charts, statistics, labeling, graphics, slide show/replay, and more.
Softpalette Fonts Volume 2	\$35.00	24325-835	Decision Science Software	Mac	A collection of 25 new and different fonts for the Apple Macintosh computer.
STAT80	\$249	75995-700	Statware	Mac	Complete statistical package for the Macintosh, this program offers capabilities ranging from simple descriptive statistics to multiple regression.
Super Draw & Write	\$19.95	82144-625	Titania Publications	II+, IIe, IIc	Includes Superfont, with nine sizes and eight styles of type. Great for program titles. Scroll, save, retrieve, and manipulate characters.
Accessories and Utilities					
Business Essentials	\$79.00	5531-150	Assimilation	Mac	AutoWriter and Data Merge included in one package. Store words, sentences, even paragraphs, then insert them into any standard letter form. List 600 items in 16 fields for easy cross reference.
Catalyst 3.0	\$149.00	3900-260	Quark	IIe, IIc	Program selector and file manager using Mac-like desktop interface. Use the mouse or keyboard. Compatible with UniDisk 3.5 and Apple's Memory Expansion Card.
Date Tickler	\$39.00	90336-175	Allegory	II+, IIe, IIc	Schedules up to 100 appointments, which can be organized in any manner. Reminds the user of upcoming events. Print calendars and keep phone numbers and addresses in two small databases.
Desk Manager	\$39.95	72240-190	Softsync	IIe, IIc	Includes five programs—letter writer, appointment schedule, phone book index, notepad, and calculator.
inTouch	\$145.00	59624-25	Palantir Software	Mac	Access commercial databases, converse with IBM PCs, or talk with services like CompuServe and the Source with this communications package.
Jeeves	\$49.95	59937-400	PBI Software	IIe (enhanced), IIc	Desktop accessory for <i>AppleWorks</i> includes appointment calendar, calculator, memo pad, phone-dialer with directory, and alarm clock.
Mac Mail for AppleTalk	\$59.95	1718-600	Aegis Development	Mac	Transfer information, mail, and files to other computers on the AppleTalk network. Send messages, receive files, or simply "chat."
Mac Memory Disk	\$29.00	5531-550	Assimilation	Mac	Sets aside part of a 512K Mac's memory as a RAM disk for fast program and file access and execution.
MicroPhone	\$74.95	73963-550	Software Ventures	Mac	Powerful telecommunications software for the Mac. Authored by Dennis Brothers, creator of <i>MacTep</i> . Features MacBinary, ASCII, and XMODEM protocols.
Mouse Desk	\$39.95	40218-508	International Solutions	IIe, IIc	File management for the Apple II-line using a Macintosh-like desktop environment. Works with all popular hard drives, UniDisk 3.5, and Apple's Memory Expansion Card.
Pinpoint	\$69.00	61253-600	Pinpoint Publishing	IIe, IIc	Nine desktop accessories for the Apple II-series—from notepad and calculator to calendar and telephone dialer. Can be accessed within <i>AppleWorks</i> .
Quick & Dirty Volume Two	\$39.95	26769-705	Dreams of the Phoenix	Mac	Includes editor desk accessory, basic desk accessory, pie and bar chart creator, mass disk copies, and more.
Quickfinder	\$29.95	33987-750	Haba Systems	Mac	A handy desk accessory which allows you to move directly from one application to another without returning to the desktop.
Tempo	\$99.00	90318-700	Affinity Microsystems	Mac	Macro-producing utility for the Macintosh which can be used from almost any application. Record even the most complex series of commands (keyboard, mouse moves, and mouse clicks), then play them back with a single keypress.
Work-n-Print	\$29.00	5531-900	Assimilation	Mac	Printing utility which allows printing while other tasks are being carried out on the Mac.

The EXPAND MACINT

David D. Thornburg
Associate Editor

Apple's newest addition to its personal computer line—the Macintosh Plus—is an expandable Macintosh that comes with 1 megabyte of RAM (expandable to 4 megabytes), an 800K double-sided disk drive, a 128K ROM containing an improved operating system and a hierarchical file system, and the SCSI (Small Computer Standard Interface) port which allows third party vendors to connect their products to the computer. This parallel port (which can transfer data at speeds up to 320K bytes/sec) allows up to seven devices to be daisy-chained to the Macintosh. Several companies had SCSI products available on the day the Macintosh Plus was released, showing that Apple is continuing to work closely with third party vendors.

The Macintosh Plus also uses a keyboard with a built-in numeric keypad and cursor control keys.

Compatibility with existing Macintosh software was important and, according to Apple's Guy Kawasaki, "The Mac Plus maintains backward compatibility with the more than 1000 software products already on the market

for the Macintosh."

The real advantage of the Mac Plus is its improved speed, something likely to make this computer more popular with the large business market. Given that large numbers of Macintoshes are starting to show up in major corporations like Peat Marwick and Arthur Young, Apple seems to be well positioned to finally increase its share of the business market.

Because the Macintosh Plus is retailing for \$2,599, Apple chose to drop the price of the Mac 512 by \$500, bringing its suggested retail price to \$1,999.

Present owners of Macintosh computers weren't forgotten. In announcing the Macintosh Plus, John Sculley, president of Apple, stressed that he didn't want early buyers of Apple equipment to be penalized by the introduction of the new products. As a result, Apple has announced a plan that allows Lisa or Macintosh XL owners to trade in their old equipment for a Mac Plus and an Apple Hard Disk 20 for under \$1,500. Those who own a 128K or 512K Macintosh can upgrade their computer to a Mac Plus through several dealer-installed packages.

The Macintosh Plus Disk Drive Kit puts an 800K double-sided disk drive and the new 128K ROM inside any Macintosh. Cost is \$299. The Macintosh Plus Logic Board Kit, which expands the internal RAM memory to 1 megabyte and adds the SCSI port, runs

\$599 for 512K Mac owners, \$799 for 128K Mac users. The larger keyboard can be purchased separately for \$129.

Even more interesting, Apple will provide direct rebates to those who bought a 128K or 512K Macintosh, or who upgraded a 128K machine, between November 17, 1985 and January 15, 1986. These rebates, \$150 on the Disk Drive Kit and \$300 on the Logic Board Kit, require that upgrades be completed before May 15 of this year.

The other new piece of hardware announced was the LaserWriter Plus—a new version of the LaserWriter which includes seven new font families in addition to the original four fonts of the LaserWriter. Existing LaserWriter owners can upgrade their printers for \$799—a little more than \$100 per font.

It's not Apple's intention to drop the 512K Macintosh. In fact, the announcement of the Macintosh Plus simply puts a new model in Apple's line. Apple now has two kinds of computers: compact computers like the Apple IIc and the Macintosh 512, and expandable computers like the Apple IIe and Macintosh Plus. Customers have a complete range of choices.

The Apple II series will remain

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Apple's newest computer, the Macintosh Plus, includes 1 megabyte of RAM, an 800K double-sided internal disk drive, enhanced operating system and hierarchical file system, SCSI port, and larger keyboard.

quite important to Apple for the foreseeable future. To provide support for both the Apple II and Macintosh computers, Apple is emphasizing compatibility in its peripheral line. In the very near future, Apple peripherals will be able to be used on any Apple computer—from the IIe to the Macintosh Plus. This is already true for products like the ImageWriter and LaserWriter printers, the Apple color plotter, and Apple's new modems. Once this peripheral line is properly adjusted, the Apple II owner who wants to upgrade to a Macintosh will find

that every Apple II peripheral can be used with the new computer. Since peripherals can end up costing more than the computer itself, Apple's move is a breath of fresh air in a market where even IBM didn't maintain joystick compatibility between its PC and PCjr.

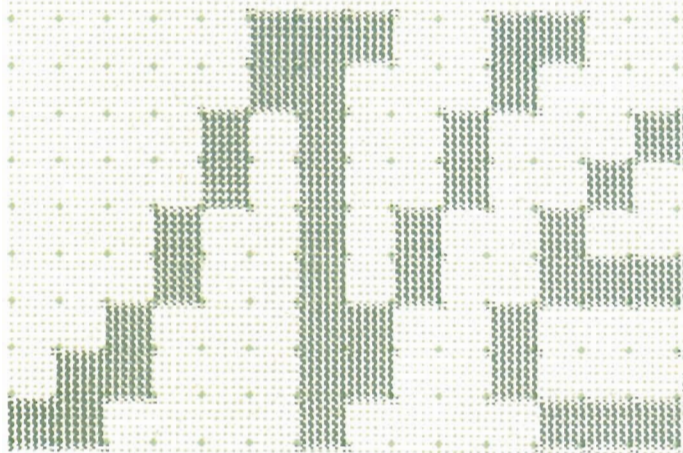
Sculley stressed that there were announcements pertaining to the Apple II line that would be coming throughout the year, but that, for the moment, the new Macintosh and LaserWriter were all the new hardware that was going to be announced.

Given the excitement that attended the introduction of the Atari ST and the Commodore Amiga, many people thought that Apple would bring out a Macintosh-like machine with blindingly-fast color graphics. In fact, rumors circulating before the AppleWorld Conference included the possibility of a color Macintosh. One might guess that Apple decided that neither of these machines posed a threat to its markets right now, and that new Apple technology could be introduced at any time. Atari, after slashing the price of the ST and moving its product into mass-market distribution, met resistance from several of its dealers. The exceptional quality of Commodore's Amiga has yet to cause this computer to strike the same customer response that introduced its Commodore 64.

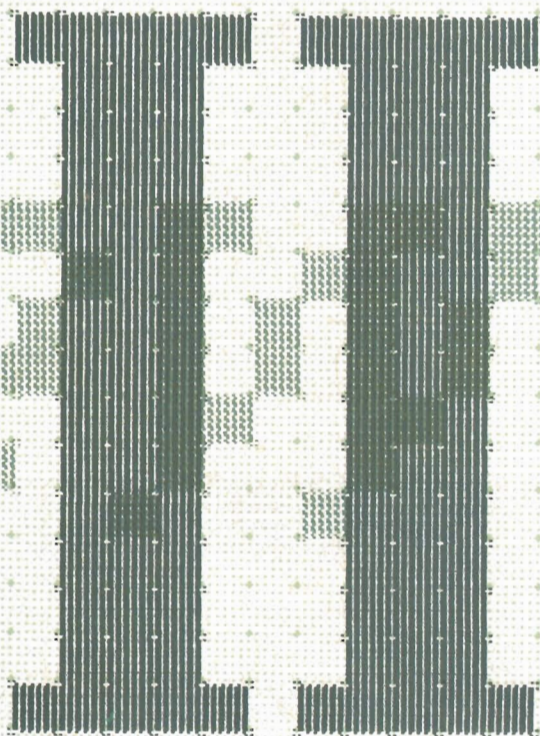
Dr. David Thornburg is a writer and software developer who has been active in the personal computer field since its inception. He writes for several magazines, including COMPUTE!, where he has a monthly column entitled "Computers and Society." He is the author of 12 books on personal computing and is the creator of Calliope, a new idea processor for the Apple II and Macintosh computers. Dr. Thornburg can be reached through Innovision, P. O. Box 1317, Los Altos, CA 94023-1317.

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Almost two years ago, Apple introduced its newest Apple II computer with the slogan, "Apple II Forever." From the looks of things, that wasn't an empty promise. Here we look at several products which transform an Apple II-series computer into anything from a memory monster to a machine which acts mysteriously Mac-like.



Chuck Doherty

Apple II-series owners have plenty to cheer about—thanks to a new generation of products which make the computer a serious contender in any league. Until recently, Apple's disk storage capacity and internal memory limitations restricted the machine from using some of the more serious applications. But now, sophisticated add-on enhancements have come to the rescue with features that bring the computer's capabilities up to state-of-the-art levels.

In addition, an exciting new crop of software has emerged which makes use of the Apple's new power. Once-complex tasks are easier and faster than ever before. In all, the Apple II line has a lot in store for everyone, and has quite a few tricks left up its silicon sleeve.

UniDisk 3.5

One of the most exciting products is Apple's UniDisk 3.5—a new type of disk drive that greatly expands the storage capacity of the Apple II-series computers. Designed for use within the ProDOS or Pascal 1.3 operating system, the UniDisk provides an impressive 800K of storage on a single, 3½-inch disk. More than enough for any serious application. If you need even more storage, two UniDisks can be daisy-chained by plugging a second disk into a connector on the back of the first.

The UniDisk attaches directly to the Apple IIc, or into an Apple IIe with an interface card. Depending on the slot you choose for this card, you can use the UniDisk as a storage device alone or as a start-up disk. Installation is easy and takes just a minute.

In addition to its increased storage capacity, the UniDisk is faster and much quieter than a standard 5¼-inch drive. Also, the shirt-pocket sized 3½-inch disks used in the UniDisk are rigid and more forgiving than a full-sized floppy, making them much easier to handle.

More and more software manufacturers are taking advantage of this new disk format by introducing packages designed for a high-capacity environment. Programs which would have been unwieldy and slow with standard floppies are now practical.

One example is the *Business-Works* series from Manzanita Software Systems, an easy-to-use

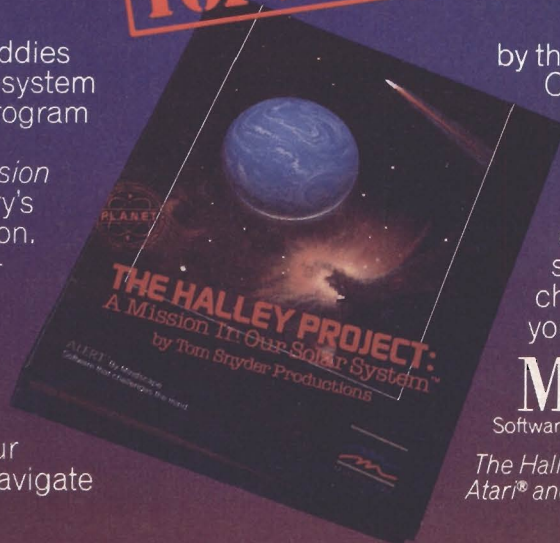
Just tell your friends you're going on a very long trip.

TOP SECRET

Kiss your earthbound buddies
goodbye and travel the solar system
in the most exciting space program
ever envisioned.

*The Halley Project: A Mission
In Our Solar System™* is history's
first real-time space simulation.
The challenge provides out-of-
this-world stimulation.

Lightweight space
controls need not apply, this
game is for qualified star pilots.
The rigorous ten-mission
training program will test your
knowledge and skill as you navigate



by the stars from planet to planet.
Complete all ten missions and be
invited to face the ultimate
challenge: the incredible
secret eleventh mission.

So take off to a software
dealer and join an elite group of
space explorers. As for your
chums, tell them you'll wave as
you fly over.

Mindscape

Software that challenges the mind.



*The Halley Project is available on: Apple®,
Atari® and Commodore®.*

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double-entry accounting system designed for the Apple IIc or IIe. The package requires two UniDisk 3.5's or a ProDOS-compatible hard disk, and has all the power a small business is likely to need for general, day-to-day accounting. On a floppy-based system, *BusinessWorks* lets you maintain a separate company on each disk, with as many as 1000 accounts in the general ledger. Hard disk users can maintain up to 50 separate companies.

BusinessWorks is available as separate modules for General Ledger, Accounts Payable, Accounts Receivable, Inventory, and Payroll. These modules may be used alone or combined through the General Ledger to make a complete, integrated accounting system. The *BusinessWorks* System Manager, which provides mailing-list maintenance as well as an operating environment for the other parts of the package, is required in order to use any part of the system.

Using *BusinessWorks* is a snap for anyone who has used *AppleWorks*. *BusinessWorks* offers the same menu-driven command structure with Open/Apple and Closed/Apple keys used for most other operations. A context-sensitive help system is also online to lend assistance when needed.

Dressing Up AppleWorks

AppleWorks, Apple's popular integrated business package, has developed a following all its own. A number of manufacturers have released programs which work with *AppleWorks* to help make your work easier. *Pinpoint* is a versatile enhancement for *AppleWorks* that adds an appointment calendar, telecommunications window, calculator, graphic print-merge, and a number of other functions to Apple's already powerful package.

Pinpoint stays in the background during regular operation, letting you use *AppleWorks* as you would normally. To activate *Pinpoint*'s special features, simply press Open/Apple-P and a window of *Pinpoint* options appears. Select the option you need, and it pops onto the screen.

The *Pinpoint* appointment calendar lets you schedule events and make brief notes for each day through 1990. A daily and weekly view feature lets you tell at a glance when you're free for lunch, or occupied with a meeting. *Pinpoint*'s telephone dialer and communications window makes transfer of data to and from a remote system easy.



BusinessWorks, with a file card appearance just like *AppleWorks*, can transfer information directly to *AppleWorks* database and spreadsheet files.

One of *Pinpoint*'s most helpful features is QuickLabel, which types an address on your envelope by reading it from a letter in the word processor. Although *AppleWorks* can make labels or address envelopes on its own, QuickLabel makes the task far easier.

After having *Pinpoint* at your fingertips for a few days, you'll wonder how you ever got by without it. Just having a calculator a keystroke away can be a tremendous time saver. Best of all, *Pinpoint* is always there when you need it and doesn't require you to stop what you're doing and load another program. When you're

through with *Pinpoint*, you return to the application you were using with all of the information exactly as you left it.

Spelling Checker, a RAM-based spelling checker, will be available from *Pinpoint* Publishing by the time you read this. Using a 55,000-word dictionary, and with the ability to store an unlimited number of user-entered words, this addition to *Pinpoint* lets you check spelling from within *AppleWorks*. Add something like this to *Pinpoint*, and you'll have an even more powerful set of accessories at your call.

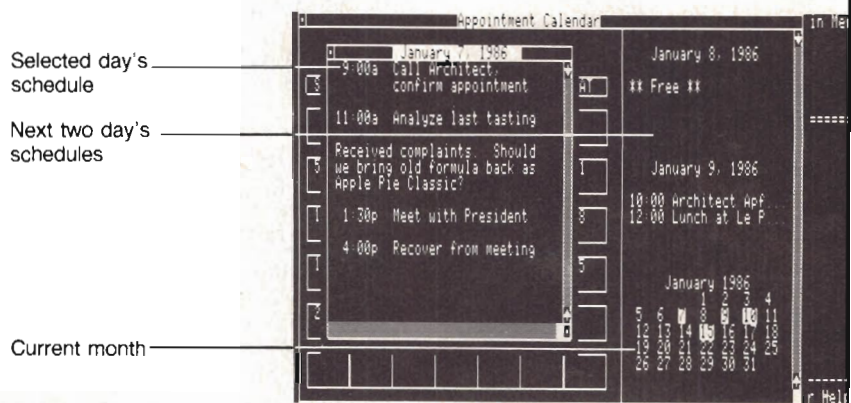
MouseWare

The Apple IIc and the Enhanced IIe both feature ROM which supports an optional mouse. This allows you to use certain software packages that incorporate mouse oriented commands such as pull-down menus and icons. A number of packages are already available and a mouse-driven version of *AppleWorks* is expected later this year.

International Solutions, Inc. is a French-based software manufacturer which specializes in mouse controlled software for the Apple II-series. *MouseDesk*, their electronic desktop system, uses the mouse with icons and pull-down menus for general system operation. Much like the operating environment used in Apple's Macintosh, *MouseDesk* makes functions such as copying files or selecting programs easier than ever before.

Moving a program from one disk to another is an involved task

Pinpoint's appointment calendar lets you enter and review notes you've made for any day of any month from within *AppleWorks*.



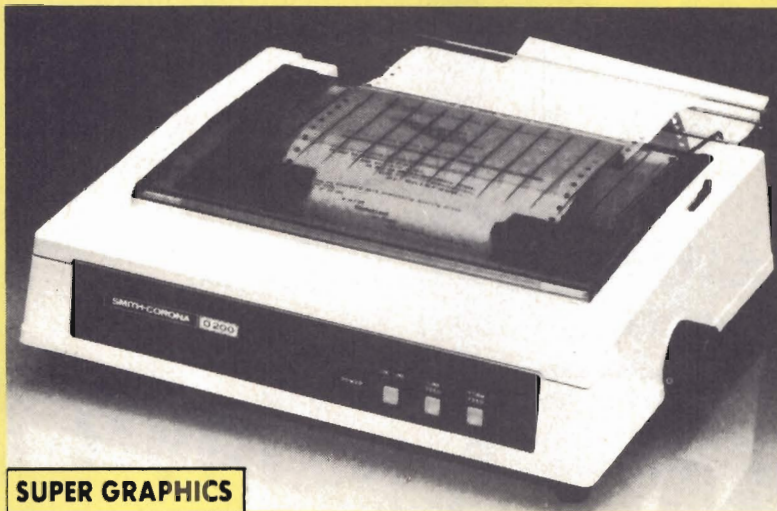
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(IBM — Commodore)

SPECIFICATIONS

(Apple — Atari — Etc.)

Size/Weight

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Depth 13.4" Weight 18.7 lbs.

Internal Char. Coding

ASCII Plus ISO

Print Buffer Size

120 CPS: 132 Bytes (1 line)

120/160 CPS Plus LQM: 2K

No. of Char. in Char. Set

96 ASCII Plus International

Graphics Capability

Standard 60, 72, 120 DPI

Horizontal 72 DPI Vertical

Pitch

10, 12, 16.7, 5, 6, 8.3, Proportional Spacing

Printing Method

Impact Dot Matrix

Char. Matrix Size

9H x 9V (Standard) to 10H x 9V
(Emphasized & Elongate)

Printing Features

Bi-directional, Short line seeking, Vertical
Tabs, Horizontal Tabs

Forms Type

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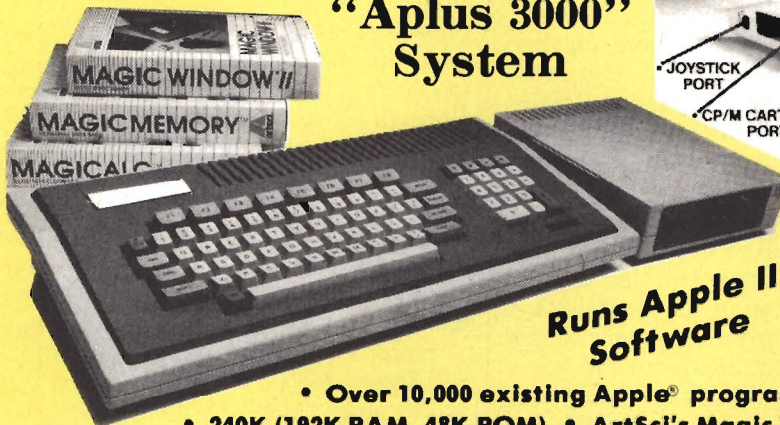
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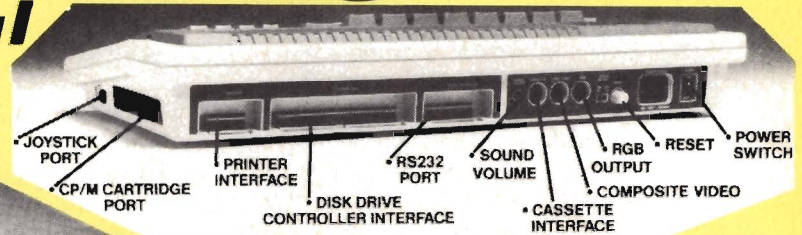
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SPECIFICATIONS

A plus 3000 is a complete, self-contained computer based on the popular 6502A microprocessor and can tap into the tremendous software library of Apple II. Features include 192K Bytes RAM, 32KB Enhanced Microsoft BASIC, 80 column text, 560H X 192V color graphic display, 81 key sculptured keyboard and high efficiency switching power supply. Also included as standard are Centronics bus printer interface, Cassette interface, 4 channel sound generator, and 5 1/4" Apple Compatible Disk Drive.

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Features	Aplus 3000	Apple IIe	Commodore C-128
RAM	192K	64K	128K
Runs Apple II Software	Yes	Yes	No
Function Keys	24	None	16
4 Voice, 6 Octave Sound	Yes	No	Yes
Composite Video	Yes	Yes	Yes
Disk Drive	Included	Extra Cost	Extra Cost
Numeric Keypad	Included	Extra Cost	Included
Video Cable	Included	Extra Cost	Extra Cost
RGB Color Card	Included	Extra Cost	Included
80 Column Card	Included	Extra Cost	Included
Centronics Printer Interface	Included	Extra Cost	Extra Cost
Drive Controller	Included	Extra Cost	Included
\$150 Wordprocessor (Magic Window)	Included	Extra Cost	Extra Cost
\$150 Spreadsheet (MagiCalc)	Included	Extra Cost	Extra Cost
\$60 Database prg. (Magic Memory)	Included	Extra Cost	Extra Cost
Your Cost	\$399.00	\$1745.00	\$1117.90

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Z-80 cart. allows CP/M use	\$ 99.95	\$ 59.95
RS232 adapter	\$ 99.95	\$ 59.95
R/F Modulator (TV hookup)	\$ 29.95	\$ 19.95
RGB cable (RGB Monitor hookup)	\$ 24.95	\$ 19.95
Centronics cable (for Centronics printer)	\$ 34.95	\$ 24.95
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80 column Hi-Res RGB Monitor	\$399.00	\$259.00

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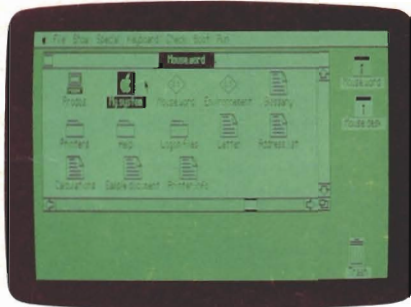
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with DOS 3.3, and not much easier with ProDOS. With *MouseDesk*, it's as easy as "pointing" to a picture of the file you wish to copy, and "dragging" it to an icon representing the disk you wish to copy it to. To delete a file, simply drag it onto the picture of a trash can—about as self explanatory as it could get.

MouseDesk supports the new UniDisk 3.5 as well as Apple's ProFile hard disk and standard 5¼-inch floppy disks. The system can even be used without a mouse by moving the pointer with the keyboard's arrow keys.

Also from International Solutions is *MouseWord*, a mouse-oriented word processor with all of the functions you'd expect from a full-featured word processing system. With *MouseWord*'s pull-down menus, you can easily change margins, find and replace text, or cut-and-paste sections of your document. When used with a versatile printer like the ImageWriter, *MouseWord* gives you full control over the style of the printed page—right down to the size and spacing of the characters.



Mac-like, *MouseDesk* is a desktop system complete with icons and pull-down menus which makes it possible to point, click, and drag to copy files or load applications.

A built-in mailing facility lets you generate customized form letters from files of names and addresses. *MouseWord* even includes a communications feature which makes transferring text to and from other computers easy.

The mouse makes it simple to select sections of text for format changes by highlighting that section of the document and then making a selection from a pull-down menu. Still, *MouseWord* is easy to use even without a mouse.

All its commands have a keyboard-equivalent which lets you work without taking your hands from the keys.

MouseCalc brings the same operating environment to a fully equipped electronic spreadsheet. What's more, *MouseCalc* includes a graphics section which plots your spreadsheet data into standard or three-dimensional graphs in full color.

Like all electronic spreadsheet programs, *MouseCalc* holds data in rows and columns and performs calculations on the data on the worksheet. A full roster of mathematical and logical functions are provided so that you can design the worksheet for almost any task.

MouseCalc's mouse-oriented structure makes worksheet design easier and faster. To select a particular portion of the worksheet for editing or printing, you simply highlight that area with the mouse. Commands are selected from pull-down menus, and a help command is available for when you need a bit more assistance.

MouseCalc can share its data with *AppleWorks* or other members of the Version Soft family. A special Link menu makes it easy to incorporate parts of your spreadsheet into other programs or to read and write DIF format files.

To help keep track of your expenses, Version Soft also produces *MouseBudget*. With the help of the mouse, you enter and analyze budget information, and the program tracks how your spending fits into your projected budget.

International Solutions also plans on releasing *MouseFile*, a database application using the same interface style as the rest of its line. Another package, in UniDisk 3.5 format, will bundle *MouseWord*, *MouseCalc*, *MouseFile*, *MouseDesk*, a communications program, and a graphics application on one disk.

All of the International Solutions programs are clearly documented and easy to use.

Since a single command structure is used through the entire series, it's easy to carry what you've learned from one package to another.

The Memory Barrier

Complex applications programs can use up memory quickly, making even a 128K machine feel out of breath. When you're ready to take on heavy-duty computing, Apple's new Memory Expansion Card lets you add from 256K to a full megabyte of additional RAM to your Apple II+ or IIe.

The Apple II Memory Expansion Card simply drops into an unused slot of your computer and makes its extra memory available to any program that can use extra working space. In the ProDOS environment, the Memory Expansion Card formats itself as an additional ProDOS volume. This makes it possible to copy large disk-based programs (such as *AppleWorks*) onto the card, greatly increasing their operating speed.

Pascal 1.3-based programs and, to a lesser degree, DOS 3.3 routines can be used with the Memory Expansion Card, but only ProDOS can use the card to the fullest. Even programs which don't recognize the extra memory can benefit from the Memory Expansion Card by using it as a temporary storage space for often-used data which would normally reside on disk.

The card comes with eight 256K chips, and includes sockets for three additional sets of eight. This way, you can add as much memory as you need, when you need it. An on-board diagnostic routine is available to check the RAM installed on the card for failure or misinstallation. A complete diagnostic check takes just three minutes.

The Business Card, from Street Electronics, is an intelligent multi-function card for the Apple IIe that combines a ProDOS-compatible clock, serial (or optional parallel) printer interface, and modem port into one

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Windows

Create Macintosh-style windows on any Apple II-series computer. Set window size, open, close, and retrieve information.

Your Personal Ledger

A complete personal financial application for tracking expenses, income, and assets. Easy to use, and packed with features from report generation to customized category codes.

Lexitron

Entertaining word game where players try to beat the clock while finding as many hidden words as possible.

Backgammon

Play the computer in this classic game. This version observes all the rules of standard backgammon.

Keynote

Short machine language utility which provides auditory feedback as keys are typed on the Apple.

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and many more!

COMPUTE!'s Apple Applications Disk offers you some of the best and least expensive Apple software on the market. The *Disk* costs only \$12.95 (plus \$2.00 shipping) and is available only through *COMPUTE!* Publications.

Complete documentation for the *Disk* is provided in *COMPUTE!'s Apple Applications Special*. Be sure to specify the Spring/Summer 1986 issue.

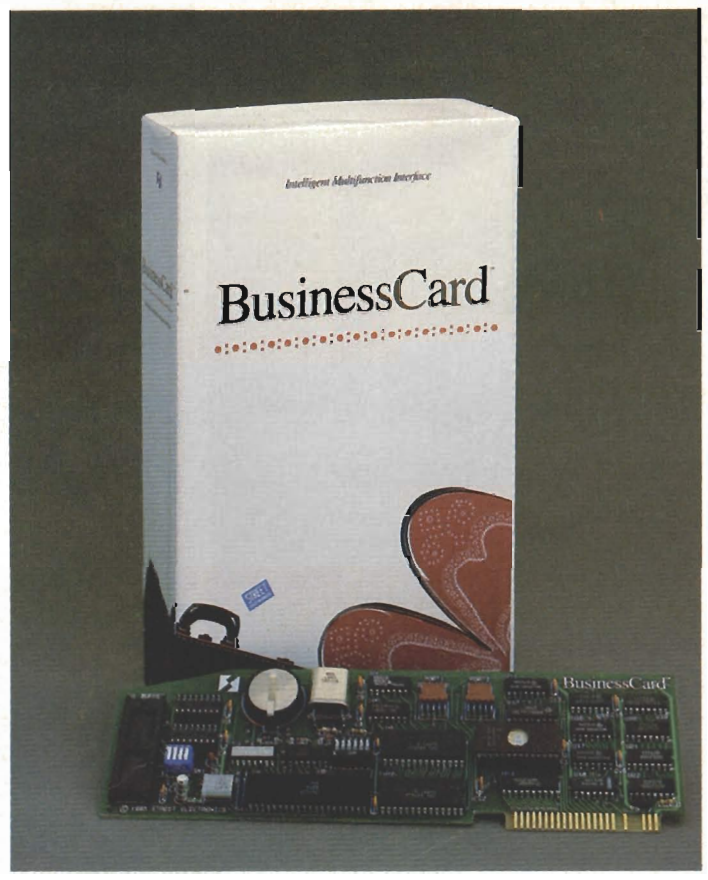
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A multi-function intelligent card for the Apple IIe, The Business Card is capable of interpreting commands from the keyboard or from within programs.

easy-to-manage package. By using a technique called "phantom slotting," the Business Card is installed in one slot, yet appears to the computer as if it were three separate cards, each installed in a different slot. This allows more versatility while placing less demand on the computer's power supply.

For both printer and modem, the Business Card uses round DIN-style connectors, which mount on the rear panel of the computer. An adapter is included in the parallel version of the Business Card to convert the card's serial data into a form a parallel printer can recognize.

Unlike most other expansion cards, the Business Card is *intelligent*, which means it's capable of interpreting commands sent from the keyboard or from within programs. If used with an Enhanced Apple IIe, the Business Card lets you control its operation through pull-down menus operated from the keyboard or with a mouse. The commands give outstanding

control over print commands such as page format and pitch which makes it easy to use your printer's full capabilities. In addition, the Business Card provides extensive hi-res graphics printing capabilities when used with a graphics-compatible printer.

Adding an optional 16K or 64K print buffer module increases your productivity even more by letting the Business Card handle time-consuming print operations while freeing your computer for more important tasks. In all, the Business Card packs a lot of features into a single slot and helps you do more work in less time.

ImageWriter II

The Apple ImageWriter II is a compact, dot-matrix printer that offers three levels of print quality—high speed draft operation at a blazing 250 characters per second, near letter quality for formal letters and presentations, and a standard mode for everyday use. What's more, the ImageWriter II

Products New II

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Cupertino, CA 95104
(408) 996-1010

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ImageWriter II (\$595)

ImageWriter II SheetFeeder (\$225)

ImageWriter II 32K Memory
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UniDisk 3.5 (\$429 [II+, IIe],
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International Solutions, Inc.
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Sunnyvale, CA 94086
(408) 773-0753
MouseBudget (\$69)
MouseCalc (\$149)
MouseDesk (\$39.95)
MouseWord (\$129)

can print high-resolution graphics, making it ideal for use with most graphics packages. By installing an optional color ribbon, the ImageWriter II can even print documents in seven colors, changing color on command. A number of software manufacturers, including Brøderbund, Sorcim, and Software Publishing, have already released or modified programs for use with the ImageWriter II's color mode.

The first time you lift this 25-pound unit you'll realize that you're not dealing with another



Apple's new ImageWriter II printer offers faster speed, better paper handling, and optional color printing for the Apple II and Macintosh lines.

flimsy dot-matrix printer. The Apple ImageWriter II is built to last, and styled to look attractive next to any Apple II.

The ImageWriter II connects to an Apple IIc through its standard printer port or into an Apple IIe through a serial adapter card (such as the Apple Super Serial Card or the Business Card from Street Electronics). A special cable is required to match the output of your computer to the 8-pin, mini-circular connector on the rear of the printer.

The ImageWriter II is surprisingly quiet for such a fast machine. The 180-character per second standard print mode is clear and sharp, perfect for everyday correspondence and program listings. With all 96 ASCII characters, 28 European language characters, and 32 MouseText characters, the ImageWriter II can handle almost any printing task without even using its graphics mode.

I found the ImageWriter's paper-handling functions (form feed, page eject, and so on) very smooth and easy to use. Single sheets feed into the printer without a fuss, and the machine's slanted design eliminates the need for a stand since a supply of paper fits directly below the printer between its widely spaced legs.

Chuck Doherty is a free-lance writer and computer consultant whose work has appeared in a variety of computer and audio publications.

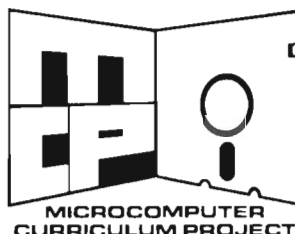
Apple's ImageWriter II can be enhanced with a number of useful options. The ImageWriter II Sheet Feeder holds up to 100 sheets of paper and feeds them into the printer automatically while neatly stacking

each printout. For increased productivity, the ImageWriter II's 32K Memory Option allows the printer to store and process up to 20 pages of text while your computer is free to tackle other projects. Network users can add the ImageWriter II AppleTalk option which allows as many as 31 separate users to share the same printer.

In all, the ImageWriter II is easily one of the best printers in its class. If you're looking for a general-purpose printer to use with your IIc, IIe, or Macintosh, there's not a better choice.

What's Ahead?

Apple's support of the II-series has been nothing short of superb through the years. In the months and years ahead, expect more and more enhancements to be released for the machine, both from Apple and from third-party support companies. Don't be surprised if your "dream machine" of 1990 turns out to be an Apple II with the latest enhancements installed. **aa**



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Off The Beaten

Dan Gutman

Here's an overview of software packages that offer something a bit different. This sampling of weirdware, author Dan Gutman's appropriate nomenclature for strange, exotic, or just plain offbeat commercial software includes something for everyone.



Software Path

One of the great mysteries of the 1980s is that people continue to ask the question, *What can I do with a personal computer?* It's a mystery because the personal computer is virtually the only appliance that can do a vast variety of things.

Think about it. You probably have a toaster, a machine which takes up a foot of space, in your kitchen. And what does it do? It burns bread. That's all. You can't

program a toaster to process words, fill spreadsheets, create graphics or music, or retrieve information from databases. All a toaster does is toast. Yet you never hear anyone complaining that toasters aren't worthwhile. You never hear anyone say, *Why should I buy a toaster? You can't do anything with it.*

Toasters toast, refrigerators cool, and stereos play music. One appliance, one task. But the computer—by its very nature—can do

hundreds of tasks. And if you think they're limited to the usual applications—word processing, spreadsheets, databases, games, and the like—you've barely scratched the surface.

There's a whole world of undiscovered software out there. Some of it's practical. Some of it's intriguing. Some of it's just plain stupid. I call all of it *weirdware*. These are just a few of my favorite weirdware programs...



If It's Tuesday, I Must Be A Basket Case

Around 1900, Dr. Hermann Swoboda at the University of Vienna noticed that his patients went through rhythmic changes in their emotional, physical, and intellectual states. These studies gave birth to the theory of biorhythms—every person's well-being varies in a continuous cyclical pattern. The minute you're born, these three biorhythm cycles begin operating.

Whether you believe in biorhythms or not, *Biorhythm Status* is a simple program that will tell you if today is going to be good, bad, or critical. All you do is tell the computer your date of birth and today's date. *Biorythm Status* is available for both the Macintosh and the Apple II computers.

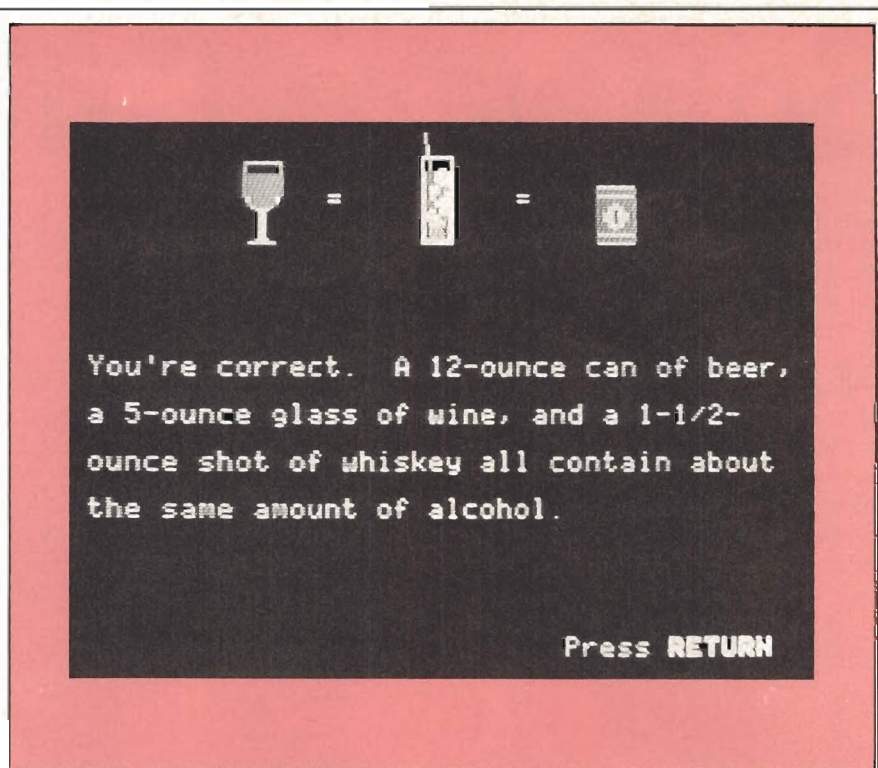
First, the program calculates the number of days you've been alive, then your cycles. Because each cycle lasts a different number of days, they don't go up and down at the same time. On any particular day, your physical cycle could be on an upswing, while your intellectual cycle could be at its worst.

On the day I'm writing this, my physical cycle is at .78, my emotional cycle is at .79, and my intellectual cycle is at .94. In other words, I'm about to enter my best intellectual period, but I'm a physical and emotional wreck.

Because you can plug in any dates, it's possible to check your biorhythms for the past or future. See how your cycles were cycling on the day you got married. See if you should be taking that vacation at the end of the summer. Even if you don't trust your biorhythms, the program is fun to run at a party.

The Loaded Disk

ALCOHOL, The Party takes you and five of your friends to a simulated party where everyone is drinking. Each partygoer has the choice of beer, wine, scotch, or a soft drink. Before you bend an elbow, the computer asks for your age, sex, weight, if you'll be eating pizza with your drinks, and if you plan to sip or gulp. All these



The consequences of drinking and driving are vividly illustrated in ALCOHOL, The Party. This simulation is an eye-opening look at the effects of alcohol abuse.

things influence how quickly the body reacts to alcohol.

Then go have a good time. Drink as much as you want, mix beer and wine, experiment—it's just a simulation. You can have as many as 15 drinks in an hour. You can't handle it, but the computer can.

After the first simulated hour of drinking, your Apple II computer tells you how the liquor is affecting you and all the other partygoers. If you just had a couple of beers, you'll be told, *Bob* (or whatever your name is), *you have a tingling sensation in your arms and legs.* Bob is also informed that his Blood Alcohol Concentration (BAC) is .005 percent and that he feels "pleasantly happy." These reports are based on what would happen in real life, under the same circumstances.

Bob also plays a little Space Invaders-type videogame to test his reflexes and perception. If your BAC is low, the game runs normally and is pretty easy. When your BAC rises, the spaceships start moving erratically and the game is very hard—showing how your perception becomes distorted

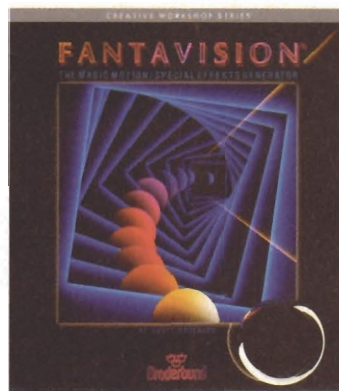
under the influence of alcohol.

Every simulated hour at the party, you can drink more, play the videogame, and get a report on your condition. When you reach .10 percent BAC, you'll be told that you're legally drunk. If you reach .15 percent, you'll start feeling sick. If you reach .30 percent, you'll pass out. That guy who took 15 drinks in an hour will probably reach .40 percent. The guests will be informed that he has died from alcohol poisoning and the party, of course, is over.

Assuming nobody gets that carried away, the party ends at midnight, and each guest has the option of driving home or asking for a lift. One of five things will happen: you'll get home safely, you'll run into a tree, you'll get stopped by the police, you'll hit another car or you'll hit another car driven by a drunk person. The BAC of each driver determines the chances of an accident.

The Party doesn't preach about drinking and driving. But participating in the simulation provides a very vivid picture of what happens to your body when you abuse it.

SET YOUR CREATIVITY IN MOTION WITH FANTAVISION,[™]
THE MAGIC MOTION/SPECIAL EFFECTS GENERATOR.



"It's Alive!"



"TWEENING" will make your animation move in a fluid, lifelike motion. And shadowing is virtually automatic.



YOU CAN create weird monsters by simply dragging circles around the screen, and using one of the special effects modes.



YOU DON'T HAVE TO be an artist to create vivid Backgrounds for your movies. Fantavision's automatic features make it easy.

IMAGINE how much fun it would be to take a simple drawing and make it come alive, dancing across the screen of your computer.

To draw an egg, and transform it into a fire-breathing dragon.

To invent weird characters and strange, alien worlds.

Then, to combine all this into your own incredible cartoon or movie.

Now, imagine if you could do all that as easily as pressing a button.

Know what? With Fantavision, you can.

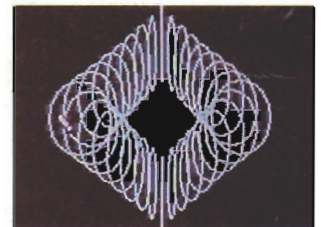
FANTAVISION IS A REVOLUTIONARY SOFTWARE BREAKTHROUGH that, for the first time, brings to home computers the special powers known to computer animators as "tweening" and "transforming."

You don't need any artistic ability or computer programming skills. Anything you draw in one frame can be fluidly "transformed" into something else in the next frame. For example, draw a plane in the air in your first frame, and a plane on the runway in your second frame. With Fantavision, your computer can instantly generate—in real time—up to 64 "in-between" frames so that your plane appears to come in smoothly for a realistic, three-point landing.

WHEN YOU SEE THE MAGIC of Fantavision, you won't believe it. When you play with it, you won't be able to stop.



YOU CAN even add Text with Fantavision, and with a single stroke make it "Lean," "Flip," "Squash," "Zoom," or parade around the screen, just like you've seen on television.



IT TAKES ONLY a few simple steps to create intriguing three-dimensional effects.



LOAD HI-RES SCREENS from other programs to make spectacular Backdrops. Then, add your own animation and Text.


Broderbund[®]

On The Road Again

Anyone who's ever tried to fold up a map while driving at 55 miles per hour will appreciate *Roadsearch*, the first computerized road atlas for the Apple II. All you do is type in your present location and the city you plan to visit. *Roadsearch* calculates the shortest practical route. It also figures out the correct driving instructions, how many miles you'll be traveling, how much time the trip should take, and how much gas you'll need. You can even command the computer to plan your trip along routes that will avoid all the tolls.

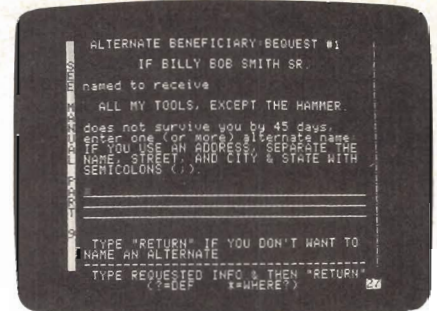
The *Roadsearch* database includes 406 cities and 70,000 road miles in the United States and Canada. You can also print out all the information on your printer so you can take it with you (unless you've got a very long extension cord).

Have It Your Way

There's plenty of diet software out there. If you're willing to eat right and keep accurate records, you can lose weight with a computer. But what about those of us who dine on Big Macs, Whoppers, and Fudgie The Whale cakes?

For people like us, there's *Fast Food Micro-Guide*, a program for the Apple II which provides complete nutritional information on your meal at McDonald's, Burger King, Kentucky Fried Chicken, Wendy's, Dairy Queen, and other fast food chains. You just type in exactly what you ordered and the computer provides an analysis of calories, protein, vitamins A, B, C, and other nutrients. Did you know that a slice of cheese quadruples the amount of vitamin A in a Big Mac?

Nobody ever said you have to go on a diet to use a diet program.



WillWriter lets you specify an alternate beneficiary in case your first choice doesn't survive you.

And To My Nephew, Jonathan

You've seen how a computer can be used with an infant (*Discover Your Baby*), a teenager (*The Party*), and an adult (*Roadsearch*). Obviously, computers can be used for some purpose every day of our lives. It may sound a little bit morbid, but a computer can be a helpful tool even after we pass away!

Have you ever thought about using a computer to write your last will and testament? Most adults over 30 pay as much as \$200 to consult with a lawyer on this less-than-entertaining subject. If you move from state to state or other circumstances change over the years, you'll have to revise your will over and over. A computer-generated will that you compose at home could thus save you thousands of dollars.

There are at least three such programs available: *Wills* (Lassen Software—Apple II), *WillWriter* (Nolo Press—Apple II and Macintosh), and *Wills* (Haba Systems—Macintosh and Apple II). None of these programs bombards you with meaningless legalese. Instead, you answer a series of understandable questions, written in plain English. Like *If Nina Wallace should fail to qualify or doesn't wish to be the guardian (of your children), who do you wish to do it?* The way you respond to each question determines which questions follow.

The questions are concerned mainly with dividing up your estate, appointing an executor, funeral arrangements, and special gifts. For example, if you wish to leave your sister Lucy the nine-foot ball of twine that you've been

```
FROM-----ATLANTA GA
TO-----CHICAGO IL
TOTAL DISTANCE--702 MILES
TOTAL TIME-----13:30 HRS:MIN
AVERAGE SPEED--52 MPH
VEHICLE MPG-----20 MPG
TOTAL GALLONS--35 GAL.
```

ROUTE SUMMARY

	TIME	MI.	ELAPSED TIME
I 75 (113MI) TO- CHATTANOOGA TN	2:10	113	2:10

I 24 (130MI) TO- NASHVILLE TN	2:30	243	4:40

I 65 (434MI) TO- GARY IN	8:20	677	13:01

I 90 (25MI) TO- CHICAGO IL	0:28	702	13:30

COLUMBIA SOFTWARE SN# 999			

Roadsearch can outline your next trip, providing detailed information on distance, time, gas, and exact routing instructions. Over 406 cities and 70,000 road miles in the U.S. and Canada are included in the program's database.

Bring the power of structured, compiled BASIC to your Apple

Operates under ProDOS

Release Your Computer's Hidden Potential

IF you've been programming in BASIC on the Apple II+, IIe, or IIc then you haven't realized the full potential of your computer yet. Now, thanks to *Micol Basic*, you can turn your Apple into a high-speed structured programming machine.

Micol Basic, the next logical step after Applesoft, is perhaps the most sophisticated programming language ever developed for the Apple II. For the first time you have the capabilities you never thought possible. Discover how easy it can now be to write superior programs that run faster. And it's so easy to learn, too, since it's based on a language you already know... Applesoft.

Much More Than an Applesoft Compiler

Micol Basic is capable of compiling your existing Applesoft programs, significantly increasing their execution speed. But make no mistake, far more than an Applesoft compiler, it contains features usually found only in the highly structured programming languages such as Pascal or C. Now you can have many of these features on your Apple without the difficulty of having to learn a totally new programming language.

Makes Applesoft Obsolete

Write programs that anyone can easily understand. Long variable names, indentation, structured loop control, improved file handling and a host of other abilities will make the maintenance of your programs a breeze. Now you can write those GOTOless programs that Applesoft never allowed you to do.

Fast Compiling and Linking

Micol Basic is written in assembly language, the fastest possible code on your computer. There is little time lost compiling or linking, giving you more time to do what you do best... program.

Effortless Editing

Micol Basic's powerful text editor makes editing your programs a real pleasure. No longer will you require an ESCAPE and right arrow sequence to do the simplest tasks. You now have edit with auto character insertion, search, replace, add, auto line number and much more to assist you.

Price Breakthrough

Based upon current prices of software on the Apple II, you could easily expect to pay \$200 for a product of this quality and utility. Few people are willing to pay that much for software, regardless of how good or unique it is. Our introductory price is only \$49.95, a price almost unheard of for a product of this significance, a price any Apple II owner can easily afford.

Engineered For People Who Truly Love Programming

But speed, structure and affordability are still not enough. A language system must not only provide you with these necessary features, it must also be convenient to use if your time spent in programming is to be truly enjoyable. And *Micol Basic* is easy to use, being engineered to the highest man-machine standards.

Fast · Powerful · Easy **ORDER TODAY**
New *Micol Basic* lets loose your Apple's potential

Micol Basic

available. It does most of the busy work, leaving you free to do what the computer cannot do... think.

Superior Documentation

Poorly written documentation is a major complaint of many computer programmers. Our documentation will be a pleasant surprise. In its over 200 pages, you'll find not only an easy to understand description of the software, but also a complete tutorial on structured programming.

Here is a partial list of additional features that can allow you to create the best BASIC programs possible:

- Fully copyable disk • Very compact, fast 6502 machine code generated
- Speed of execution several times that of equivalent Applesoft programs
- More structured loop capabilities than virtually any other programming language • IF/THEN/ELSE/ENDIF • Block structuring • True integer, or mixed integer/real arithmetic • Fast integer FOR loops • Variable names of any length • Boolean variables • Dynamic strings • Multidimensional arrays
- Complete implementation of Applesoft graphics • Additional commands such as MOD, INDEX, DELAY and more • Advanced file handling capabilities • Complete support for either 40 or 80 column operation
- Operates under fast, versatile ProDOS • Superb debugging facilities
- Compiled listings to screen or printer • Complete diagnostic information during and after compilation • Visible code generation if desired • Easy interface with machine language programs • Allows maximum memory for user's programs • Chaining • Error handling facilities • No licensing fee for commercially written software required • All utilities tailor-written for the Apple II in 100% machine code

ATTENTION EDUCATORS: Now you have the ideal tools for teaching programming on the Apple II; Applesoft in ROM for the beginning students and *Micol Basic* on disk for your more advanced students.

Order Now. *Micol Basic* is the programming tool you've been waiting for. Don't wait any longer. Use the convenient order form below or for faster service on credit card orders call the order desk. Toll-Free 1-800-268-1121 (24 hrs a day, 7 days a week) and ask for operator 89.

\$49.95

Dealer inquiries welcome

MICOL SYSTEMS
9 Lynch Road
Toronto, Ontario,
Canada M2J 2V6

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☐ **YES**, I want the best BASIC language system ever developed for the Apple II. Please send me _____ copies of *Micol Basic* at \$49.95 ea. plus \$5 ea. for shipping and handling, total of \$54.95.

Use _____ copies = \$54.95 = \$ _____ Cdn _____ copies = \$49.95 = \$ _____

☐ Payment enclosed (check or money order)

☐ Charge my credit card: ☐ VISA ☐ MASTERCARD

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Send to: **MICOL SYSTEMS**
9 Lynch Rd., Toronto, Ont., Canada M2J 2V6

For faster service call the order desk Toll Free

1-800-268-1121

and ask for operator 89 (please have your credit card ready)

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DISCOVER YOUR BABY

Birth to Two Years



This Discovery Portfolio is a unique electronic-age child development tool for parents with computers. Interdependent software and print elements blend what is known about children and parents with what is known about books and computers to create this new kind of child development guide.

Discover Your Baby, created with the help of several educators and child psychologists, poses questions to help you determine your child's developmental level.

Squeaking And Drooling

Does your newborn son turn away when you try to clean his nose? Does your baby girl squeeze dolls in order to make them squeak? These are two of the questions asked of parents who buy *Discover Your Baby—Birth To 24 Months*, a software package for Apple II-series computers. The program attempts to help you determine what stage of development your child is in.

Discover Your Baby begins by asking for your baby's name, sex, and birthdate. True/false questions are then asked about the child's behavior and skills in four developmental areas—moving, thinking, talking, and feeling. If you answer yes to questions like, *Does she cry if you leave her alone in a room?* more questions are generated. The questions were created with the help of several educators and child psychologists.

When you start answering "no" it's an indication that a certain level of development has been reached, but not surpassed. The program generates a graph illus-

trating your baby's progress in each performance area. The graph tells you which percentile your child is in, compared to others in the same age group.

When your baby reaches a milestone in development—such as rolling over, laughing out loud, or crawling—computer music celebrates the good news. A milestone screen is displayed announcing the event. You can even print this out and tape it to the refrigerator or send to the relatives.

Softball Software

A few seasons ago Major League Baseball discovered computers. Managers parked personal computers in dugouts to help them make crucial decisions about pinch hitting, stealing, pitching out, or sending the pitcher to the showers.

But you don't have to be in the big leagues to use a computer. College teams, high school teams, and little leagues can now computerize their statistics—or you can keep records of your favorite

pro team just for fun. Almost every sport involves a lot of book-keeping. A computer can take a lot of the numerical drudgery out of your hands, so you don't need to have a mind like a computer.

Baseball Statistics is an electronic sports spreadsheet for Apple II computers. It keeps cumulative totals and per-game averages for as many as eight teams of up to 25 players. For pitchers, the program tracks games won and lost, innings pitched, runs scored, ERA, complete games, wild pitches, balks, and eight other categories. For hitters, it tracks at bats, hits, sacrifice flies, RBIs, runs scored, stolen bases, times caught stealing, and more. The program also has space for entering inning-by-inning scores, runners left on base, extra inning games, and one-run games. All these stats can be entered in just a few minutes after each game and printed out for future reference. Information like this may help a manager play the percentages correctly in a crucial situation.

If the strategy fails, of course, the manager can go into the owner's office and say, *Hey, it's not my fault—the computer told me to do it!*

Wanna Bet?

For most of us, a day at the races involves hunches, guesswork, luck, and coming home with less money than we started with. *Thoroughbred Handicapping System*, with versions for both the Macintosh and Apple II computers, lets you put some science behind your bets. After you plug in past performance records of horses and jockeys, the system balances class, pace, speed, distance, trainer, and other factors to help you pick a winner. When you only bet on races in which a horse has a distinct advantage, you'll increase your chances, and your winnings. The program helps you handicap the entire day's races in about an hour.

The manufacturer, PDS Sports, is betting the company on gamblers. They also make a program that handicaps NBA basketball games, and an NFL football handicapper that selected 70 percent winners during the 1984 season.

**NEW
FOR
YOUR**

apple



MacOffice: Using the Macintosh for Everything

Sharon Zardetta Aker Paul Freiberger Arlan Levitan
Selby Bateman Vahé Guzelimian Dan McNeill
Charles Brannon

This newest release from COMPUTE! Books shows you how to get the most out of your Macintosh and software. Practical demonstrations teach you how to fully utilize several commercially available programs, such as Microsoft's *Word*, *Chart*, *File*, and *Multipan*, Apple's *MacTerminal*, and others. You'll see how to:

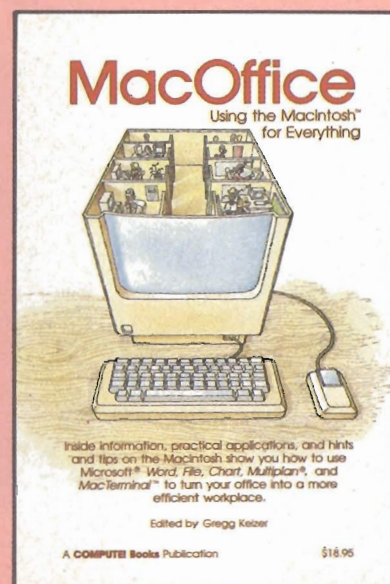
- Create form letters with *Word*,
- Use *Multipan* for your accounting,
- Share information between offices with *MacTerminal*.

Here are the ins and outs, hints and tips on how to use each program most efficiently, and previously undocumented techniques.

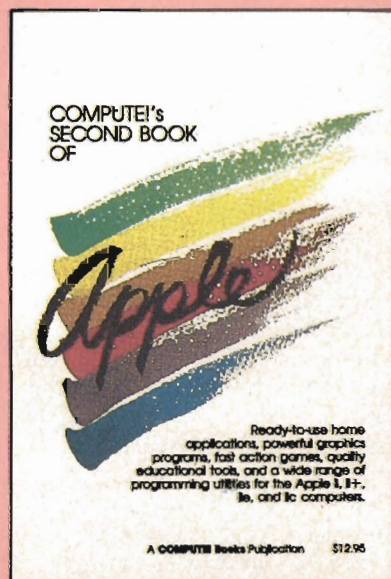
Extensively illustrated with actual Macintosh-created documents and graphics, *MacOffice* shows you how you can integrate programs, let them share information, making it even easier to manage your business with a computer. You'll also learn about networks—where computers, printers, and other devices are connected to create an office-wide working environment—with details on how to create a network, and what to look for in network software.

\$18.95 ISBN 0-87455-006-8

personal computer



Look for these new titles at your local book or computer stores or order directly from COMPUTE! Books.



COMPUTE!'s Second Book of Apple

Edited


With over 30 programs, this collection for Apple II+, IIe, and IIC owners contains arcade-style games, games of logic and education, applications, graphics generators, and programming utilities. Compiled from the most recent issues of *COMPUTE!* magazine and *COMPUTE!'s Apple Applications Issue*, these programs include dazzling graphics, high-speed game play, and valuable programming techniques. All the programs are ready to type in.

Applications calculate your financial situation and turn your computer into a remote terminal for accessing sophisticated databases. Action games put you in a jet fighter and in a bowling alley. Educational games range from a five-level chess game to a program which lets you write quizzes on any subject. Graphics and programming utilities help you design custom graphics or put a RAM disk in your IIC.

\$12.95 ISBN 0-87455-008-4

There is also a disk available which includes the programs in the book. You can order this disk directly from COMPUTE! for only \$12.95 plus \$2.00 shipping charges.

COMPUTE! Books are available in the U.K., Europe, the Middle East, and Africa from Holt Saunders, Ltd., 1 St. Anne's Road, Eastbourne, East Sussex BN 21 3UN England.

COMPUTE! Publications, Inc. 
One of the ABC Publishing Companies

To order, call toll-free 800-346-6767 (in NY 212-887-8525) or mail your payment (including \$2.00 shipping charges) to COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, NY 10150.

Look! Up In The Sky!

In the larger scheme of things, you and your computer, your house and your hometown, even the United States and Earth are insignificant specks of dust floating in the vast universe. But don't get depressed. Now there's a computer program for either the Apple II line or the Macintosh which

at the horizon, or imagine that you're lying on your back and looking straight up in the air. If you're wondering where the North Star is, the program will highlight it and tell you its precise location. If you see an interesting star but don't know its name, just position the cursor over it and the computer identifies it for you. You

longitude and other scientific-sounding parameters. In recent years, astrologers have turned to the computer to do their calculations.

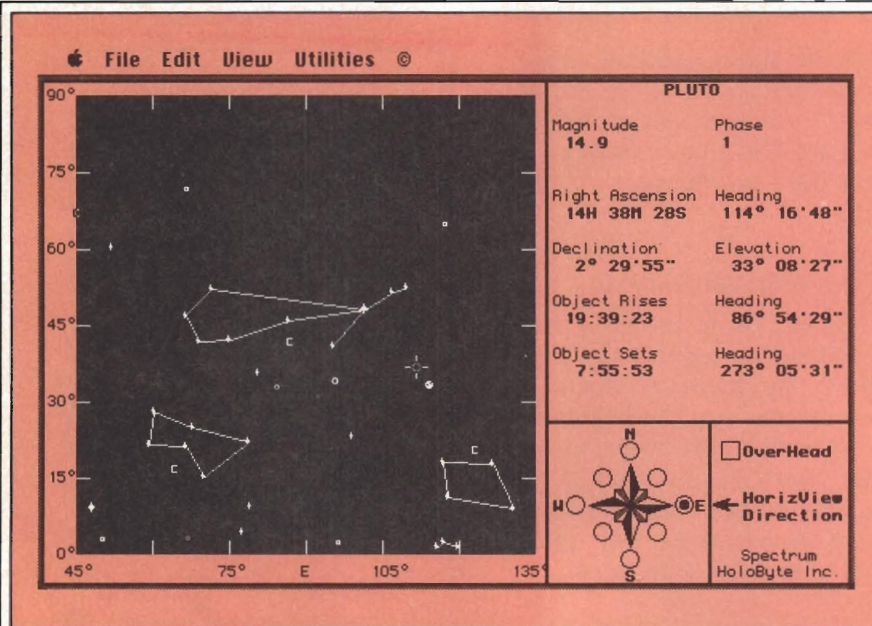
Astrolabe makes astrological software only. Here are a few of the programs they offer for the Macintosh (512K and two disk drives required) and the Apple II-series personal computers.

Astro-Scope is an easy-to-use horoscope interpretation program. All you do is type in your birthdate, the exact time of day you were born, the correct time zone, and the latitude and longitude of your birthplace. A listing of the chart positions will appear on the screen, followed by a list of the planetary aspects. Press the Return key and you'll see about seven pages of text discussing your personality, psychological nature, and your strengths and weaknesses.

Contact Astro-Report asks for the same information as *Astro-Scope*, but it's aimed at couples contemplating romance. This is called a composite chart. It takes the charts from each person and makes a third chart out of it, sort of like a baby. Page one is the familiar wheel-shaped astrological natal chart showing the 12 houses, or parts of the life, for the couple. Then comes a five or six-page analysis of what each of the pair needs in a relationship. The program won't tell you to get married or split up. It attempts to show the couple how to make the best of their strengths and overcome the potential problems in the relationship.

The company makes astrological software to analyze just about every time span in your lifetime. *Life Astro-Report* interprets the positions of Jupiter, Saturn, Uranus, Neptune, and Pluto so you can look at a decade or more of your life. *Yearly Astro-Report* follows the position of the sun, and *Monthly Astro-Report* follows the moon. For real astrological fanatics, there's even a *Daily Astro-Report* and an *Hourly Astro-Report*.

The only unproven point is the theory—why should the position of a planet millions of miles away have anything to do with a baby born on Earth?



Available for both the Apple II and Macintosh lines, TellStar can show you any part of the sky at any time, for any day. Here, Pluto's position (just below the cursor) on April 8, 1986, is seen here from central North Carolina. (The lines indicate constellations.)

lets you look up in the sky and observe, locate, and identify constellations, stars, and planets.

To run Spectrum Holobyte's *TellStar*, you enter the exact latitude and longitude of your location—anywhere on the Earth (to get a nearby latitude and longitude, you can call the National Weather Service office in your area.) Then you're asked for the month, day, and year. The computer makes the necessary calculations and gives you an exact graphic representation of what the heavens look like from your particular vantage point, at that moment in time. You can, for instance, see what the night sky looks like to the people in Paris, London, or Newark. You can pick a date anytime between 0 A.D. and 3000 A.D.

You can use your keyboard like a telescope and swing it back and forth across the sky. You can look

can also print out a copy of anything on the screen.

TellStar won't help you track down any E.T.'s or Starmen, but when they do land in your backyard, it will help you find out where they came from.

Star Quality

Astrology is the belief that your personality and psychological makeup are influenced by the position of the stars and planets at the moment you took your first breath. You may not buy it, but professional astrologers take their work seriously. They don't just ask you your birthday, look up in the sky, and predict your future. A thorough reading requires hundreds of calculations involving geocentric longitude and latitude, right ascension and declination, altitude and azimuth, heliocentric

Discover Your Baby—Birth To 24 Months

Random House Software
400 Hahn Rd.
Westminster, MD 21157
(800) 638-6460 \$59.95

TellStar

Spectrum Holobyte
1050 Walnut, Suite 325
Boulder, CO
(800) 443-4656 \$49.95 (Level 1)
\$79.95 (Level 2)

Baseball Statistics

Educational Activities
P.O. Box 392
Freeport, NY 11520
(800) 645-3739 \$63

ALCOHOL, The Party

Marshware
P.O. Box 8082
Shawnee Mission, KS 66208
(800) 821-3303 \$49.95

Biorythm Status

Ashby & Associates
P.O. Box 594
Chagrin Falls, OH 44022
(216) 247-8113 \$24.95

Astro-Scope

Contact Astro-Report

Life Astro-Report

Yearly Astro-Report

Monthly Astro-Report

Daily Astro-Report

Hourly Astro-Report

Astrolabe

Box 28

Orleans, MA 02653

(617) 255-0510 \$295 each

Fast Food Micro-Guide

Learning Seed
21250 N. Andover Rd.
Kildeer, IL 60047
(312) 397-4470 \$49

Thoroughbred Handicapping System

PDS Sports
P.O. Box E
Torrance, CA 90507
(213) 212-7788 \$129

Roadsearch

Columbia Software
P.O. Box 2235
5461 Marsh Hawk
Columbia, MD 21045
(800) 835-2246, Ext. 172 \$34.95

Wills

Lassen Software
P.O. Box 1190
Chico, CA 95927
(916) 891-6957 \$79.95

WillWriter

Nolo Press
950 Parker St.
Berkeley, CA 94710
(415) 549-1976 \$39.95

Wills

Haba Systems
6711 Valjean Ave.
Van Nuys, CA 91406
(800) 468-4222 \$49.95

(Macintosh version requires
MacWrite; Apple II version requires
word processor)

collecting, you can enter that information into the program.

When you're finished (with the will, that is), you can print out a paper copy of the document. The programs automatically insert any necessary legal terminology, which can't be altered by yourself or anybody else. The programs satisfy the legal requirements of 49 states and the District of Columbia (sorry, Louisiana).

The best thing about computerized wills is that you can change them any time you want. When your children grow up, for instance, you can delete all the child guardian clauses. Better yet, if somebody in the family gets on

your nerves one day, you can easily cut him or her out of your will with a few simple keystrokes, then insert a different beneficiary. That's one way to keep your relatives on their toes.

There are hundreds of programs out there like these. The next time somebody whines, *I'd buy a computer, but what would I do with it?*, you'll have a ready rejoinder. **aa**

Dan Gutman is a free-lance writer whose bi-weekly computer column appears in over 20 newspapers. He is the co-author of The Greatest Games (COMPUTE! Books), and is currently working on a weirdware book.

Copies of articles from this publication are now available from the UMI Article Clearinghouse.

For more information about the Clearinghouse, please fill out and mail back the coupon below.

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300 North Zeeb Road, Box 91 Ann Arbor, MI 48106

MacAdds

M ♦ O ♦ R ♦ E

For The Macintosh

Gregg Keizer, Editor and Stephen Levy, Book Editor

The deluge of new products for the Macintosh shows little sign of abating. From hardware like Apple's Hard Drive 20 and external RAM devices to software for checking and caching applications, the flood continues.

Two megabytes of external RAM. Twenty megabytes of program storage space. Spell-checking desk accessories and macro editors. Eight-hundred kilobyte drives. The choices seem almost endless.

The Macintosh, just past its second birthday, is a computer with a full complement of hardware and software support. Unlike 1984, when it was released, and unlike newer 68000-based computers such as the Atari ST and Commodore's Amiga, the Macintosh now has so many possibilities and configurations that most of us are simply overwhelmed. There's so much, and never enough time (and especially money) to put it all together.

Listing all of the new products

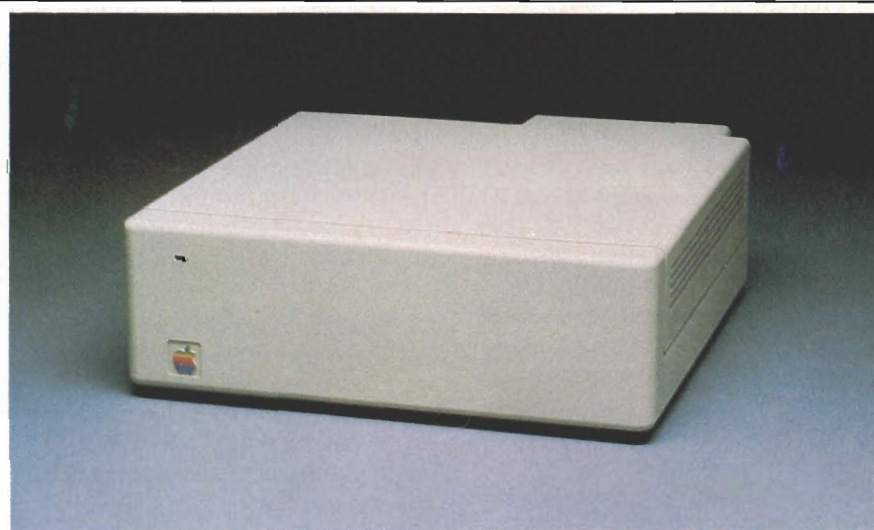
for the Macintosh would fill an entire volume. Instead, here's a look at just a few of the more interesting and unusual hardware and software products available for your Macintosh.

A Hard Apple

One of the most important hardware additions to the Macintosh is Apple's new \$1,495 Hard Disk 20, a 20-megabyte hard drive that's

relatively inexpensive considering its power and ease of use. Even a hard drive novice won't find any intimidation here, for everything from setup to daily use is refreshingly simple.

Connected to the disk drive port—not one of the serial ports as are all other non-Mac Plus hard drives—the Apple HD 20 can be up and running within ten minutes of unpacking. Plug in the powercord, connect the cable to

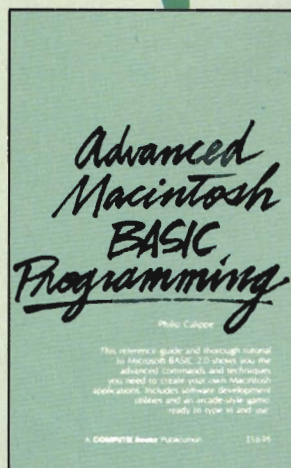


Apple's new hard disk, the HD 20, provides 20 megabytes of storage, and with the Finder 5.0, uses a hierarchical filing system (HFS) for easy file access.

All
The Best

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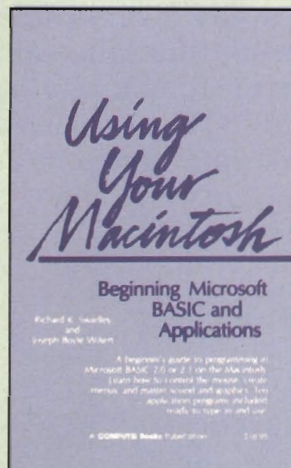
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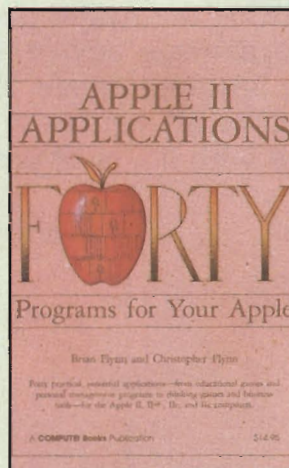
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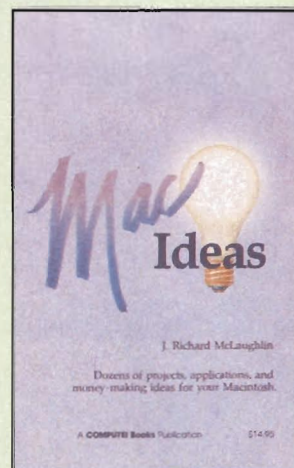
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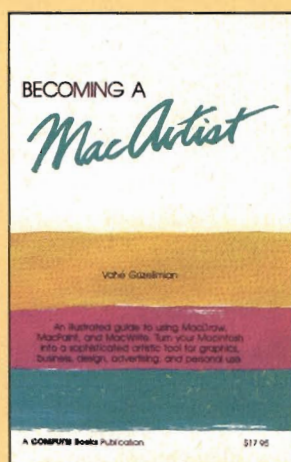
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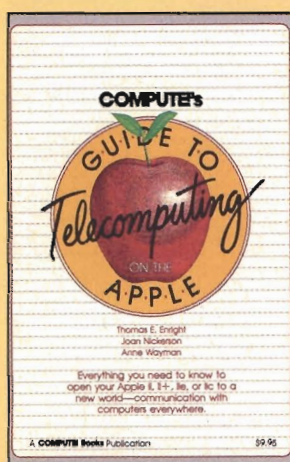
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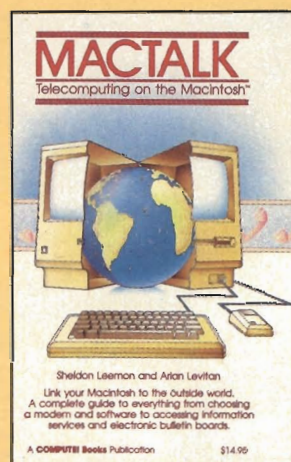
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the back of the Mac, and insert the drive's startup disk in the Macintosh. Turn on the hard drive's power, wait about 20 seconds, then turn on the Mac. Initialize the hard drive. That's about it.

You must start the HD 20 from the startup disk provided, one of the device's detractions. That takes a few seconds. The better method of booting the Mac directly from the hard disk isn't yet available, though it's rumored to be not far in the future possibly by the time you read this). Once you're running, you're more than

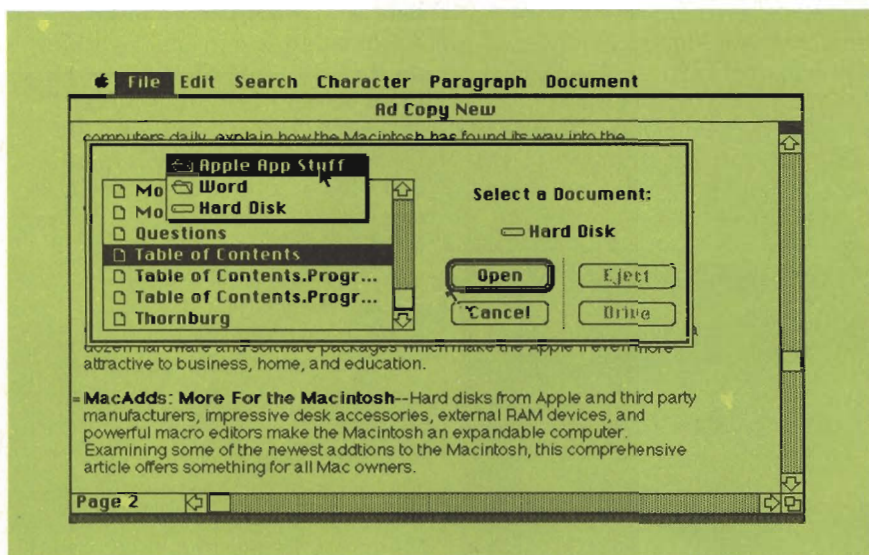
With all these files and applications, though, how can you expect to find what you're looking for? The desktop can get *extremely* untidy when you've filled even a couple of megabytes. The answer is a neat one, one which is comfortable for anyone who has used the Macintosh.

Through the Finder 5.0, the HD 20 uses a hierarchical file system (HFS) which allows resizeable folders for simple, manageable filing. Unlike some other hard drives, which organize files into drawers

ous—at the moment—is the lack of a back-up application. There's no way to back up the disk except to manually copy files to floppies. Even worse, there's no way to easily tell which files have been modified since the last backup (without keeping track of that date somewhere, and watching the *Last Modified* notation on files displayed on the desktop). Other hard disks include software which can tell you which files have not been backed up since the last such procedure.

And since you can only copy folders whose contents are less than 400K to floppies, you may have to break down folders into their components to do a back-up. Files, obviously, cannot be larger than 400K if you want to successfully copy them to a floppy. (This limitation can be relieved if you have an 800K microfloppy drive.)

There also seems to be a wide variety of Macintosh software that, for one reason or another, is incompatible with the Hard Disk 20. Make sure that you have an opportunity to see your preferred software actually run on the Hard Disk 20 at a dealer before you make your purchase.



When you're using the Finder 5.0 and the HD 20, Open boxes allow you to open nested folders by pulling down the directory menu.

halfway there.

But what do you do with storage space comparable to almost 50 400K microfloppies? Anything you want. Applications (those that aren't copyprotected like *MacPaint* and *MacWrite*) and all your files can be copied directly to the hard disk with the usual dragging from the Finder. Copyprotected software is a bit trickier, but with hard disk copying utility (there are several available commercially), you can probably port your most frequently used programs to the HD 20. Some software, like Microsoft *Word*, you can drag to copy, but you'll have to keep the master disk handy as a key. This is endemic to all hard drives, not just Apple's, and is one of the major stumbling blocks to complete ease-of-use.

with definite minimum space limits—a possible waste of hard drive storage space—the HD 20 lets you put together folders of any size. You can nest folders within folders in as many levels as you want, opening them with the standard double-click. Saving and opening files from within applications is handled just as neatly.

You can open a file which is on the desktop, or select a file from any folder, or even from a nested folder. Simply double-click on a folder—it is now the directory and its files/folders are listed. You can easily move through nested folders by doing this.

Faster than the microfloppy drive in everything from copying files to loading applications, Apple's Hard Drive 20 does have some drawbacks. The most seri-

Tin Can RAM

If you're using memory-intensive programs—like *Excel* or *Jazz*—or accessing larger than normal documents in applications like *MacWrite* you'll quickly find that even 512K of RAM in the Macintosh isn't enough. The program, or document, simply takes up too much of the Mac's internal memory. The standard 400K drives present much the same problem, for you're often restricted in the number and size of documents on one disk. *PageMaker*, for instance, with its System and Master disks, leaves you little room for your work. Another disk, for documents only, gives you three disks and only two drives.

You have alternatives—increase the Macintosh's RAM through a warranty-voiding third party upgrade, or buy an expensive hard disk. Apple's Mac Plus upgrades—RAM to one megabyte and 800K double-sided drives—certainly alleviates the problems, but not

everyone has the \$900 to upgrade from a 512K, or the \$1100 from the 128K.

Another, less expensive alternative is making its way onto the desks of Mac owners. Called the DASCH (for Disk Acceleration/Storage Control Hardware), it's an external RAM device that acts like an electronic disk drive. Connected to the printer port (so that you can still use a second mechanical disk drive) it stores data—whether applications or documents—in RAM. The speed increases in executing programs, and saving, loading, and scrolling through long documents is impressive.

Western Automation Laboratories offers the DASCH in three sizes—500K, 1000K, and 2000K. Its own power supply means that even if the Mac itself has a system crash and locks up, the data in the DASCH remains viable. Only if

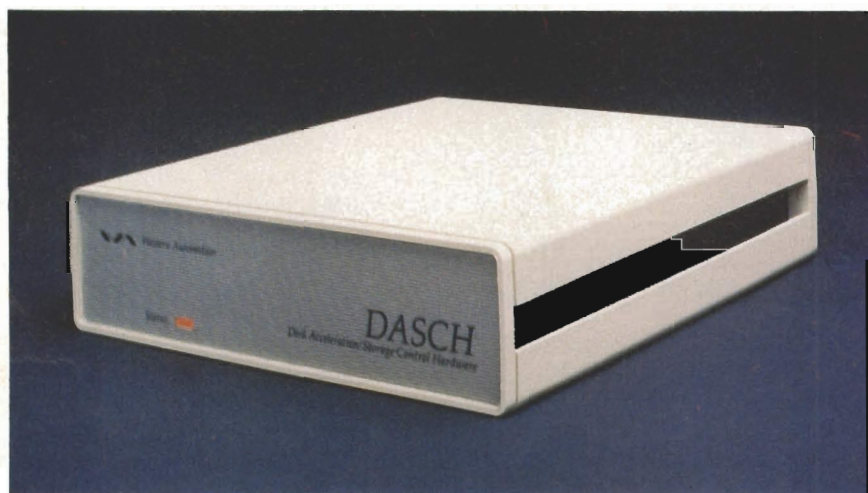
From then on, the DASCH acts just like any other drive, albeit an extremely fast one. Application loading times are at least three to four times faster than from a floppy. Opening Microsoft *Word*, for instance, takes only six seconds using the DASCH, sixteen seconds directly from a floppy. The DASCH is especially attractive when using a disk-based program like Microsoft *Word*. Documents aren't stored entirely in RAM, but are brought in chunks from disk as needed. *MacWrite 4.5* works the same way. When you're editing a long document, scrolling backwards and forwards, this almost constant disk access is time consuming. Put the documents in the DASCH, though, and you'll be hard pressed to even notice the disk access. You can zip from top to bottom as fast as the Mac can refresh the screen.

you work on something else.

The DASCH is not a memory upgrade—if you're using the DASCH with a 128K Mac, for instance, you can't run applications which require a 512K computer. Neither is it a hard disk, though if you leave it on all the time (which isn't a problem), you have what is in effect a permanent storage device. But the DASCH is a fast disk-like device. And because of its separate power supply, it's impervious to system crashes and program lockups.

The obvious next step for the DASCH is a battery backup, so that if the power goes out, the data isn't eliminated. Western Automation is currently working on this, but date of release and price haven't been announced.

With prices of \$495 for a 500K DASCH, \$795 for a 1000K, and \$995 for a 2000K, the DASCH is something to consider. Compared to the Mac Plus upgrades, both the 1000K and the 2000K DASCHs are less expensive. The 1000K DASCH working with a 128K Macintosh is particularly attractive.



The DASCH device, available in three configurations, acts as a super-fast external RAM disk, speeding up program loading and file access.

you have a general power-outage will the DASCH's contents be wiped out.

Inset the DASCH startup disk in the Mac and its contents are copied to the DASCH. Simply pop disk after disk into the internal drive and the software keeps copying to the device. Loading 800K of files and applications takes only 30 seconds or so.

A backup application is included with the DASCH, making it simple to copy modified files back to disk before you turn off the device. Run the application and it will tell you which disks to put in the drive to back up altered files. New files are listed, letting you decide where they should be saved.

Though the DASCH connects to the printer port, that doesn't mean you can't use your printer. Attach the printer cable to the back of the DASCH device, set aside some of the DASCH's memory as a print spooler, and you can print while

Turbo Mac

The front of the box says *TurboCharger*, software to make your Macintosh faster. And that's exactly what it does, simply and easily.

The manual is a mere 12 pages, only two of which are needed to show you how to install the program. And once *TurboCharger* is installed on a disk, you never have to worry about it again. Its operation is completely transparent, except for the increased speed of Macintosh applications.

TurboCharger is not a RAM disk application, though it has some similarities. Instead, it's a *disk caching* system, which stores frequently-used disk sectors of a program in 512K Mac's RAM. If the Mac needs to read something from disk, it first checks to see if the sectors have been placed in RAM. If the data's there, it pulls it from RAM instead of from disk, considerably speeding up application access.

During development of a BASIC program which used sequential files, for instance, *TurboCharger*

allowed only one sequential file access from disk in a two-hour session.

When used with *MacWrite*, much of the disk access you've come to expect, especially when scrolling and editing a document, was eliminated. One problem came up, though, when using *TurboCharger* with *MacWrite*. *TurboCharger* had been set so that it used the maximum amount of RAM. Once the document became ten pages long, memory problems began cropping up. Inserting and defining text became difficult. The solution was easy—we just reduced the buffer size used by *TurboCharger*.

System file on a *MacWrite* 2.2, *MacWrite* 4.5, or *Microsoft Word* disk. Although *MacSpell+* takes up only 32K on the disk, that disk must have at least 80K available before installation. If you're using 400K disks, then, you'll have to do some file deletion to squeeze on *MacSpell+*. After installation, you can replace some of the files. The 75,000-word dictionary, which takes up 354K, will have to be placed on a disk in the external drive or put on a hard disk. If you're working with 400K drives, the best solution is to put the dictionary on a document-only disk, though this leaves you less than 50K for your documents. A hard

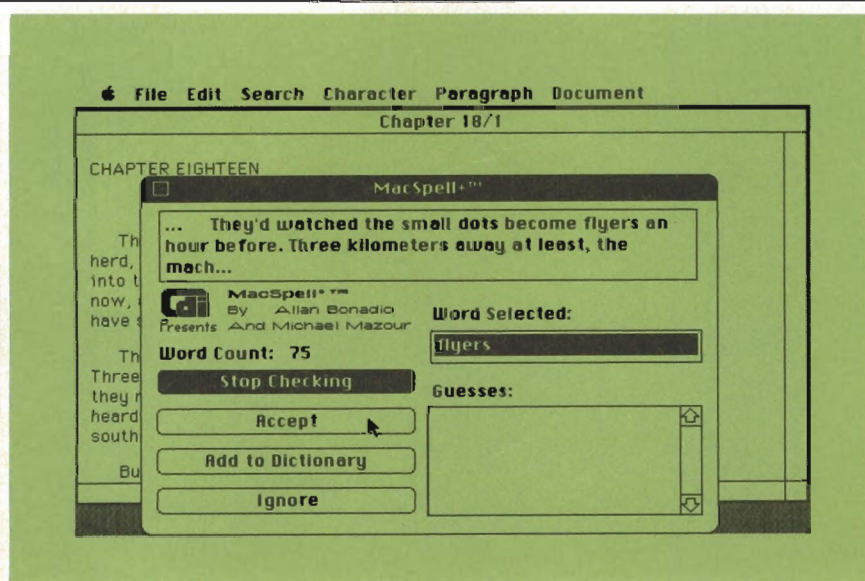
Once you start *MacSpell+*, it looks through the document a page at a time and displays questionable words. Both the word and its context appear in the window. From here, you can accept the word (if it's a proper noun, for instance, that's spelled correctly), add it to your personalized dictionary so that *MacSpell+* will recognize it next time as correctly spelled, ignore it, click one of the possibilities in the *Guesses* box, or directly edit the word by clicking and typing in the *Word Selected* box.

MacSpell+'s dictionary is extensive, but when you're checking a long document, be prepared to spend some time at the computer. You have to constantly monitor *MacSpell+*'s progress, making decisions as each misspelled or questionable word is found. The program would be much more versatile if it could check a document automatically, then present you with a list of words once it was finished.

When we used *MacSpell+* with *Microsoft Word*, there were several instances where the *Word* window was shifted to the left, making *MacSpell+* think that portions of words on the left side of the window were misspelled. Once that happens, the only solution is to manually shift the *Word* window back.

MacSpell+ also allows you to check the spelling of a single word by double-clicking on it, then bringing the *MacSpell+* window to the front. Though you can add up to 3,500 new words to the dictionary, you may have need to remove some at a later date, perhaps because you added misspelled words. A utility program which removes unwanted words from the supplementary part of the dictionary is available from Creighton for \$5.

If you have a 512K Macintosh or a Mac Plus, *MacSpell+* is a welcome addition to your word processing tools. The large dictionary means that fewer words need your attention, and its interactive nature makes it a perfect tool for checking just the occasional word that you're unsure of—a much more productive technique for most writers.



MacSpell+ is an interactive spell checker which appears atop a MacWrite or Word screen when you select it from the Apple menu.

Spell Well

If you write, whether for a living, a hobby, or just occasionally, you undoubtedly find yourself paging through a dictionary more than you'd like. A recent wave of spell and/or grammar checkers for the Macintosh can turn much of the chore over to your computer, not to your fingers.

Two recent additions to the Macintosh, *MacSpell+* from Creighton Development and *The Right Word* from Assimilation, point out the directions various spell checking programs are taking.

MacSpell+ is an interactive checker. For the 512K Macintosh and the Mac Plus, *MacSpell+* installs as a desk accessory in the

disk, an 800K drive, or a DASCH device makes things easier.

Like any desk accessory, *MacSpell+* is accessible from the Apple menu while you're using the word processor. To use *MacSpell+* while writing or editing a document, click on *MacSpell+* from the Apple menu, then open the *Words* dictionary file. The *MacSpell+* window appears atop the word processor window.

You can either hide the *MacSpell+* window behind the word processor window and call it to the front from the Apple menu, or shrink the word processor window a bit so that you can still click on the *MacSpell+* window. The latter method is faster.

The *Right Word* takes a different approach to spell-checking, one more common at the moment. Not a desk accessory, *The Right Word* is a stand-alone application. That means you have to exit from Microsoft Word (the only word processor supported by the program) before you check your document. The process is just a matter of running *The Right Word*, then opening the document you want to check. *The Right Word* displays questionable words in context as well as showing the word alone. A possible correct spelling of the word is usually highlighted in the box on the left. You can even scroll through this list, and click on any to see variations.

Your choices are fairly standard to spell checkers, ranging from ignore and replace to substitute and dictionary. If you find the correct spelling in the dictionary list, you can simply click on *Substitute* and the word is inserted. If you don't find the word in the list, however, you can manually type its correct spelling by choosing *Replace*. *Dictionary*, as it implies, adds the word to the dictionary.

All this pertains to *The Right Word* when you're using the 40,000-word dictionary version. Another version, *The Right Word XL*, is included on the disk, and puts a 200,000-word dictionary at your disposal. This is really intended for hard disk owners, for when using the large dictionary from disk, *The Right Word* operates so slowly that it's a hindrance, not a help.

The Right Word also lets you decide whether you want to check spelling, grammar, or both before opening a document. The grammar checker finds every occurrence of words like *to*, *two*, *too*, *their*, *they're*, *there*, and gender pronouns such as *she* and *he*. It's much faster to do this kind of proofreading yourself, rather than spend long sessions seeing the word to highlighted again and again.

The Right Word does work on a 128K Macintosh, though disk access is increased. But the program,

especially *The Right Word XL*, really shines when you're using a hard disk.

Other spelling checkers are available for the Macintosh, but the process is much the same as *The Right Word* or *MacSpell+*. Look for other desk accessory-style spelling checkers in the future, especially for the Mac Plus with its 1 megabyte of RAM.

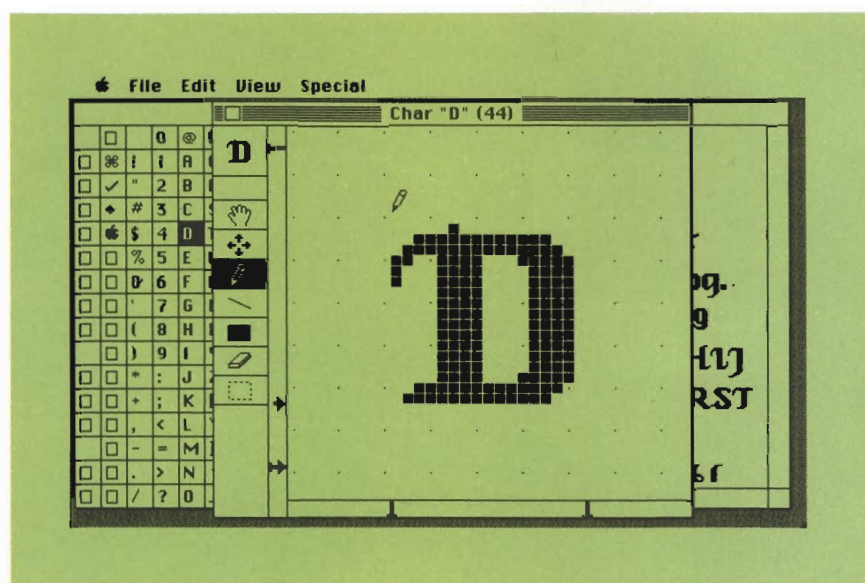
Fonts Fonts Fonts

If you've become proficient with *MacPaint*, you'll feel right at home with *Fontastic*. Use *Fontastic* to design your own fonts, redesign fonts

Once you have decided whether you are going to design your own font or just redesign a font already in your library, you'll see a grid full of all the standard keyboard characters. Pull down the *View* menu and select *Actual*, and you'll quickly see all the characters of the font you selected and, in the sample window, as many characters as can fit in the window, about one-third of the screen.

Just select the character you wish to edit, and the edit window appears. Editing is easy with the pencil, erasers, line and box tools, but designing takes practice.

If you attempt to create your



With *Fontastic*, you can edit existing fonts or redesign your own from scratch.

you already own, or design picture fonts to suit your specific needs.

Whether you're an artist or all thumbs, you'll find the features of this font editor quick and easy to learn because, like so many applications for the Macintosh, it uses the same types of menus and drawing techniques. *MacPaint* users will notice the familiar hand, pencil, and other tools they have become accustomed to using.

Fontastic can be divided into three parts. First is the Font Selection Window, which is quite similar to *Font/DA Mover*, and can perform many of the same functions. In addition to copying and removing fonts, however, the Font Selection Window acts as your entrance to the font editor.

own font, or just play around with copying characters, you'll soon begin to appreciate the skill and care that went into creating the fonts you find on the Macintosh.

The *Fontastic* disk comes with a number of fonts of its own, including a Russian character set and two reverse New York fonts.

Disk Doubling

Four hundred kilobytes of disk storage just doesn't make it any more. You don't have to be a power user to run up to the limits of the Macintosh's 400K disk drives. All too often, you're forced to spread documents and their applications across a handful of disks. It will get worse. More and

more powerful software is requiring two program disks—one for the actual application and one for the various Macintosh system files.

Apple's obviously realized this, for the Mac Plus includes an internal 800K double-side drive. Present Macintosh owners can upgrade their 128K or 512K Macs to an internal 800K drive for less than \$300. External 800K drives run \$500. Both accept single- or double-sided disks, so your current software library will remain that way.

If you've got a one-drive system now, or if you're ready to sell your 400K external drive, there's an option other than Apple for a double-sided drive. Several third-party manufacturers, Mirror Technologies' and Haba Systems among them, offer 800K double-sided external drives. Both act like any external drive, except that you can pack twice the information on a disk.

Let's say you have a one-drive 512K Mac. Upgrading with Apple gives you an internal 800K drive, but you're still stuck with only one drive. You can't add an external 800K Apple drive without the internal upgrade. But for \$429, you can have Mirror Technologies' Magnum Drive or at \$399, Haba's HabaDisk 800 as an immediate double-sided external drive. Now you've got two drives.

Both drives are as easy to install as any Macintosh peripheral. Just plug it into the external drive port at the back of the computer, buy some double-sided disks (you *could* use single-sided drives, but there's no guarantee that the other side has met the manufacturer's testing requirements), and you're set.

All disk functions—from copying files to loading applications—operate normally. You can use either manufacturer's drive as the startup drive by inserting a disk in that drive before you slip one in the internal. Because of commercial copy-protection schemes, you'll probably find that it's easiest to use the Magnum or HabaDisk to store the System, non-copy-protected appli-

cations like *MacPaint* and *MacWrite*, and your documents and files.

The HabaDrive works identically to an Apple external drive, but the Magnum requires a manual disk eject. Normally, when you select *Eject* from the *File* menu, choose *Eject* from an *Open* or *Save* dialog box, or drag a disk icon to the Trash, the disk pops out automatically. The Magnum shows a small light when the disk is ready to eject—press the button on the front of the drive, and it springs out.

One interesting benefit of the Magnum, or HabaDisk, or of any 800K drive, is that you can back up larger folders when its connected to the HD 20. Apple's hard disk only lets you back up a folder (without breaking it into its components) whose size is less than the floppy's. With a 400K drive, in other words, you can only back up folders less than

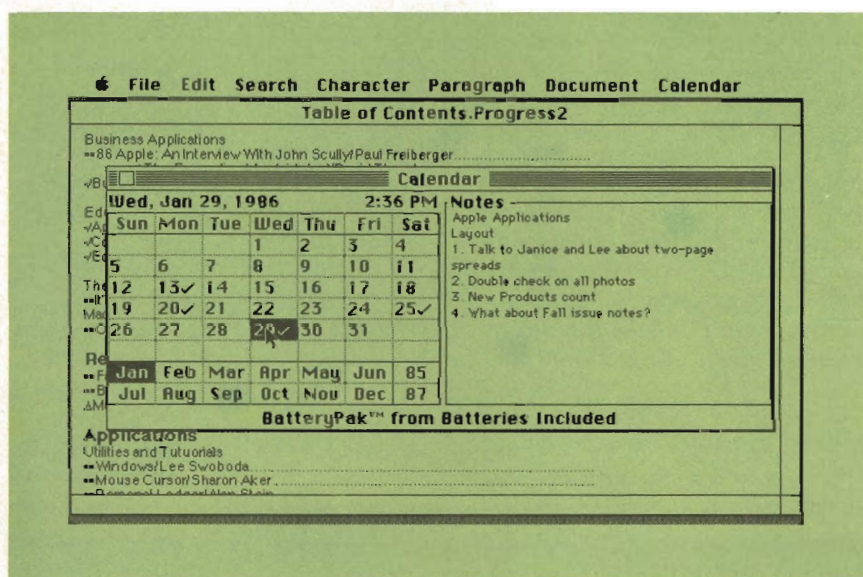
the RAM disk from one floppy.

An interesting alternative to Apple's upgrade, especially for one-drive Mac owners, the Magnum and HabaDisk immediately add punch to your machine.

Under The Apple

The Macintosh isn't capable of true multi-tasking. Two major applications cannot run at the same time, no matter what illusion *Switcher* creates. The closest that the Macintosh can come to multi-tasking is through its desk accessories, that short list of simple applications under the Apple menu. An unaltered System file offers desk accessories ranging from an eight-page note pad to a digital alarm clock. No matter what you're doing, you can turn to the Apple menu and put the clock, alarm, scrapbook, clipboard, calculator, or puzzle on the screen.

This flexibility has made the



The *Calendar*, one of the seven desk accessories in the *BatteryPak* collection, lets you enter notes for any day of any month. Days with notes appear checked.

400K. An 800K drive eases that restriction. Folders up to 800K can be backed up to disk.

You'll also find that an 800K drive makes it simpler to use external RAM disks, like the DASCH unit from Western Automation. Setting aside a 200K printer buffer leaves 800K free in a 1000K DASCH, just the right size for loading everything into

desk accessory market boom. One such desk accessory package is *BatteryPak*, from Batteries Included. This collection of seven desk accessories provides an expanded set of small applications—none are larger than 13K—for all your Macintosh tasks.

BatteryPak includes a calendar, 250-page notepad, two different calculators, a disk utility, print

utility, and program launcher. They can be installed with *BatteryPak's* own *Mover* application or with Apple's *Font/DA Mover*—directions are simple and the process takes just a few steps. One of the interesting options of *BatteryPak's Mover* is *Try*, which lets you see what the desk accessory can do before you decide to install it in a System file.

You probably won't find a use for all these accessories, but the choices are yours to make. The most useful are the calendar and the large notepad. The calendar, which comes in two versions—one for the 128K Mac, another for the 512K Mac and Mac Plus—lets you click on any day of any month, even advance or go back years, then enter up to 12 lines of notes for that day. Schedules for the upcoming month, reminders of meetings or birthdays, anything can be entered. Days with notes attached are shown with a checkmark beside them. Click on any checked day and the notes immediately appear. A *Find* command lets you search through those notes to find the days where you've entered *Staff Meeting*, for instance. This search function makes the calendar an excellent scheduling tool

which you can call from within any application.

The 250-page notepad is more than just an expanded version of Apple's desk accessory. Not only do you have more room available for your notations, but the accessory also has a *Find* command for zipping through the simple database you've established. Perfect for keeping phone numbers, addresses, and other information, the accessory also has a *Dial Number* command which lets you select phone numbers by dragging or double-clicking. With your modem connected to the Mac, the phone number is automatically dialed. All you have to do is press Return when someone on the other end (whether it's a breathing human or a computer database service) answers. This alone makes the notepad invaluable when you're using a telecommunications program which doesn't include its own automatic dialer.

The other desk accessories—RPN Scientific Calculator, RPN Arithmetic Calculator, Launcher (which sends you from one application to another when you *Quit* the first), *DiskTools*, and *Print Text*—are all excellent accessories which you may find need for.

Adding more accessories to your Apple menu is easy with *BatteryPak*. At only \$49.95, the calendar and phonepad alone make the package well worth the money.

Press A Key

One of the most powerful features of applications like *Lotus 1-2-3* for the IBM PC and *Excel* for the Macintosh is *macros*, the ability to program a series of commands and have those commands execute at the press of one or two keys.

Macros are a bit more difficult to create on the Macintosh simply because of its user interface. Mouse movements and clicks don't always translate into keystrokes. With *Tempo* from Affinity Microsystems, however, you can have macro capability with many Macintosh applications.

Tempo is a macro creator and editor for the 512K Macintosh and the Mac Plus. You can create macros of almost any complexity by recording a series of key commands, menu selections, and text entry. Anything you can do yourself *Tempo* can do for you. Like many other programs, *Tempo* can be simple to use if you're recording fairly simple macros, or complicated if you get into some of the program's more advanced features, like branching or pausing.

Tempo installs as a desk accessory using its own installation program. This takes several minutes as the program strips unnecessary resources from the System file and places its own in that file. *Tempo* is large, adding about 60K to the System file, which means that you may have trouble finding

The MacAdds

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Tempo

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Boulder, CO 80302
(303) 442-4840
\$99

TurboCharger

Nevins Microsystems, Inc.
210 Fifth Avenue
New York, NY 10010
(212) 563-1910
\$95

room for a complete System folder and a major application on one disk. After the installation, you'll see the word *Tempo* under the Apple menu. Click on this, and a Command key symbol appears on the menu bar. You're ready to begin.

Just click on *Start Recording*, and then go through the various commands and menu selections you want to assign to a macro. An example might be opening *MacWrite*, closing the *Untitled* window, opening a selected document, scrolling to the end of that document, then placing the cursor at the very end of the file. Choose *Stop Recording*, and you're asked to assign a Command key combination to the macro, as well as a macro name. From that point on, you can call the macro either by pressing the Command key combination, or by selecting *Tempo Command* from the *Tempo* menu, then choosing the appropriate macro name by double-clicking.

A variety of features lets you create extremely sophisticated macros. Branching allows you to link several macros together for a chain-like effect where one macro calls another, which may in turn call yet another. Pauses can be inserted in a macro to let you enter something in a dialog box, or to delay the execution of the macro until a specified amount of time has gone by, or even to make the macro wait until a definite time. This latter feature is especially useful when you create a macro that logs on to a commercial database—you can tell the macro to begin running late at night, when rates are lower. With a completed macro, you can then log on, retrieve selected information from the database (like your electronic mail, for instance), save that to disk, then log off. All without your supervision.

You'll encounter some problems with *Tempo*, primarily in compatibility with other software. Unless you have the new ROMs installed, for example, you can't use both the HD-20 and AppleTalk. Several programs have strange problems—software such as *Jazz*, *OverVUE*, *ThinkTank 1.0*, and Microsoft *Word* have varying degrees of incompatibility. *Word*, for instance, has several dialog boxes which require you to use *Tempo's* Real Time recording option.

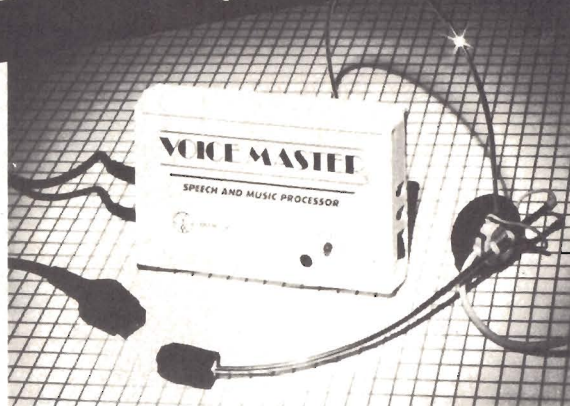
Macros can be addictive. You'll find yourself hitting the Command key to do everything from quitting an application to searching and replacing text.

There's Always More

Now that the Macintosh Plus is available, you'll begin seeing hardware and software which takes advantage of its one megabyte of RAM, HFS file system, and the SCSI port. Hard disk drive manufacturers like AST, Micah, and Iomega have already announced SCSI-compatible products. Software packages like *Excel*, *Jazz*, *PageMaker*, and *Helix* have been enhanced to efficiently use the additional memory of the Mac Plus. Other products, from external two megabyte RAM disks for under \$700 to new and powerful software, will continue to pour into the market. There's no sign that the flood of additions for your Macintosh is about to stop. Thank goodness.

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Apple Rules The Schools

Fred D'Ignazio
Associate Editor

It's well-known that Apple has a lock on the educational market. Less well-known is how the company managed to put more than a million Apple II-series computers in the schools. This inside look at Apple and the schools describes how it happened, and explores the latest trends in educational computing.

Apple computers are in more classrooms than any other kind of computer—the Apple II family is the number one computer in primary and secondary schools, and Macintoshes are increasingly popular in colleges and universities.

With more than a million Apple II+'s, IIe's, and IIc's in grade schools and high schools, Apple's hold on the educational market is, to say the least, strong. In fact, according to Anne Wujcik, an analyst at New York's Talmis, Inc., and an expert on the education market, these Apples represent over 55 percent of all computers used in grades K-12.

Apple is the clear leader in educational computing, and its lead is growing. According to Sue Talley, Apple's K-12 Educational Sales Manager, seven out of every ten new computers purchased by schools during 1984 and 1985

were Apple IIs.

"Apple has had no competition in the last 12 months," says Wujcik. "Tandy has dramatically lost its share of the market. IBM has abandoned its PCjr. And the new Commodore machine, the 128, is regarded as an updated version of an old machine, the C-64, which educators and serious educational software developers regarded as too low-level and cutesy. As a result, there is nothing compelling to draw teachers away from Apple."

In the meantime, students at universities and colleges have purchased over 100,000 Apple Macintoshes. The Macintosh is the largest selling student-bought microcomputer at the college level.

Apparently, Apple rules the schools—at least for now. But how has it accomplished this? And what happens to the computers once they're in the classroom?

A Crucial Switch

The Apple II wasn't always the leading educational computer. As recently as the 1982-1983 school year, says Wucjik, Apple IIs were running neck and neck with Tandy's TRS-80 and Commodore's PET computers. Then Apple made a crucial switch in their thinking. They realized that the key to expanding computer sales beyond the relatively small hobbyist market was to acquire a strong base of software developers. Software, not hardware, was going to be the biggest attraction to new computer users. The software had to be high quality, and there had to be a lot of it.

To get software, Apple began aggressively wooing third-party software developers, particularly those in the educational market. Apple offered the developers shared advertising, discounts on development machines, and technical support. Developers responded and produced thousands of educational programs for Apple II computers over the next three years. In 1983, as leading developers started pulling away from other computers—because of the Apple's relatively advanced design at the time, and because other manufacturers weren't as supportive to third-party developers—most of the best new education programs ran only on Apples.

That same year—1983—saw the big push in education to buy microcomputers. As states and school districts went shopping, only Apple IIs offered the variety and quality of software they were looking for.

The Soft, Fuzzy Company

Another big plus for Apple was its advertising. Through its ads, Apple was able to present itself to educators as a "warm and fuzzy company." It also convinced educators that it was a company that cared about education.

This image took a beating in 1984 when the Macintosh was introduced and Apple changed its emphasis to the business market. In early 1984, Wucjik attended a meeting of teachers who were actively using computers. She was surprised to hear the teachers

The Key Is Ease

Robert Lock, Editor In Chief

It was not too many years ago that computer-assisted instruction meant fill-in the instructor-generated blanks using randomly presented computer-stored questions. Period. A quiet revolution in college level computing began at Dartmouth with the development of something called BASIC, or Beginners All-purpose Symbolic Instruction Code. With this "natural" language, students were, for the first time, able to rise above the constraints of mathematical languages such as FORTRAN (FORmula TRANslator) and other "mainframe" languages. The Dartmouth experiment was considered revolutionary. Many visionary educators even speculated upon a time when every student would have access to a computer *terminal*. So much for the sixties. It's 1986 and every student may soon have access to their own stand-alone computer that's also quite capable as a terminal. And each and every one of these computers is more powerful, faster, and incredibly easier to communicate with when compared to the multi-story, multi-room computers our forebears began on forty years ago.

Students who less than five years ago were bound to languages such as BASIC now face no language constraints at all. The icon-based universe of the Macintosh, a graphic second "language" to its college student users who have grown up with it, seems almost beyond belief to those who experienced the earlier "breakthroughs." The key is ease. Ease of access, ease of use, ease of manipulation. We are an impatient generation, and our computer tools have grown increasingly easy for us to reach. In this article, the significant point made in several ways by our authors is simply one of access. The Macintosh is useful in the *blank*. Whether it be in the study of Shakespeare, or music, or writing skills, or language fonts, the message is clear. We no longer have to deal with the medium, we can move immediately to the message.

The effort of computing represents a balance of complexity that has significantly shifted in the past few years, and the first major component of that shift was the Macintosh. Other computers now have come along that may have arguably improved upon that shift in complexity, but Macintosh made the first quantum leap into this new generation. So, while many of these uses described in the attached article may seem "old hat" to you, we suggest you take a moment to gaze out the window. Literally ten years ago there are those of us here who were getting excited about the availability of BASIC, and the appearance of things you-put-together-yourself-from-a-kit called microcomputers. We hope the enthusiasm is as great ten years from now.

muttering and complaining during an Apple executive's speech. The teachers felt neglected, and Apple was quickly losing credibility in the education market.

Fortunately for Apple, its executives picked up on this growing dissatisfaction, and the company once again began supporting educators and software developers.

When Steven Jobs left the company last spring, Apple did some soul-searching that again started educators worrying. However, ac-

cording to Wucjik, John Sculley, Apple's chief executive, recently briefed the New York analysts, and made it clear that "Apple wants the education market. Their minds are made up. The commitment is there."

Discounts For Educators

Apple has two discount programs for education. The first program, *step pricing*, is a simple discount formula that lets schools get a

better price on larger orders. For example, an Apple II (and related equipment) will cost X dollars if the school's total order is between \$5,000 and \$25,000. However, the price drops significantly if the total order is above \$25,000, and drops again for orders above \$100,000. These volume discounts act as a powerful incentive to budget-conscious schools to order more computers at one time.

In the second discount program, the *Volume Purchase Agreement*, Apple makes a multi-year lease-purchase deal with a school. This lets a school acquire its computers immediately, but payments can be spread over three years. And, if the computers are not satisfactory, the school can return them, without making any remaining payments.

Knowing The Market

Part of Apple's success in the education market comes from its long experience. After seven years of selling Apple II's to educators, Apple knows how schools buy computers. Apple marketeers know the requirements, the rules and regulations districts live with, necessary to sell computers to a school. They know the bidding process at the state level, and they know how important it is to attract large state departments of education (like those in California, New York, and Texas) and large educational groups, such as CUE (Computer Using Educators).

At the local level, Apple has established the Education Dealer Program to coordinate school purchases with local computer retailers. Apple sells directly to the schools through its 26 offices in major metropolitan areas, but it relies on the dealers to help educate the school district by informing them about Apple's pricing, discount programs, and options.

Ten days before a shipment of computers reaches a school, Apple notifies the dealer so that they can install the computers and provide orientation and training for teachers and administrators. It's the dealer's responsibility to show schools how they can get non-Apple hardware and software products to go with their new Apples. And after the computers are

installed, the dealer is responsible for maintenance and repair of any broken machines.

Computer Buying—Gulliver

All these support programs and discounts provide a powerful incentive to educators looking for new computers. But they aren't



The State of Tennessee's program, "Computer Skills Next," placed 14,000 Apple computers in schools across the state, establishing well-equipped computer labs like this one at Hixen Junior High.

worth anything if Apple doesn't meet the acid test—the contract bidding process. Almost all schools must go through this process before they purchase a new computer, and the winner is the company that offers the lowest price.

Price is the most important factor, but it's no longer the *only* factor. Over the last few years, school districts and state departments of education have become sophisticated computer consumers. Their bid specifications to computer manufacturers have become knowledgeable and demanding. These days, a company that wins a large educational contract must have the lowest priced computers, but it must also offer a lot more, including training, maintenance and repair contracts, and discounted add-on equipment.

One of Apple's most spectacular successes in education has been with the state of Tennessee, which over the last two years has bought over 14,000 comput-

ers—7000 for the state department of education and 7000 more for local school districts.

Three years ago, Dr. James Kelley, of Tennessee's state Board of Education, and his microcomputer advisory committee set up a program to put computers in the hands of Tennessee's 140,000 seventh and eighth graders. "We had

done our homework and we knew exactly what we wanted," says Dr. Kelley. "We had the funding we needed (\$9 million) and a complete implementation strategy. We went to the manufacturers and said 'here's what you have to do to have your hardware in the first statewide mandated computer literacy program in the U.S.'"

The program, known as "Computer Skills Next," began with the release of bid specifications from Dr. Kelley's committee to the major computer manufacturers. Six companies submitted bids—Apple was the low bidder. Its price—\$733 for an Apple IIe with a color monitor and a single disk drive—was just \$2.00 lower than Tandy's price for a 64K Color Computer 2. "We didn't know who would win the bid," says Dr. Kelley. "We certainly didn't pick Apple. We didn't think they had a chance against Tandy."

To win the contract, Apple had to offer the same low price to all the schools in the state of Tennessee. It also had to promise to fix every broken computer in less than 24 hours or replace it with a working computer. It had to set

up or license a service center within 75 miles of every school in the state, set up a toll-free private number for schools to call with any questions about the computers, and pay for the printing of all training materials developed by the state of Tennessee. Not only that, but Apple had to teach school administrators and teachers how to service and maintain their machines, as well as post a \$1 million performance bond if it defaulted on any term in the contract. According to Dr. Kelley, "Apple never came close to defaulting. All the computers were in the classrooms, up and running, on November 1st."

Computer Buying— The Lilliputians

Not all educators are as lucky as those in Tennessee. They have to shop for computers on their own, without the funding, support, and expertise of a state-funded group. But most still end up choosing Apple computers.

In Vestavia Hills, Alabama, just south of Birmingham, Carolyn Baumgartner is the principal of Southminster, a small private school with 200 children in grades K-6. "I started out the dumbest person in computers," says Baumgartner. "But the interest was there. I've been in education for a while, and I've seen more fly-by-night doodads than you'd care to shake a stick at. But, about a year and a half ago, I decided that computers were here to stay. So I began looking."

The father of one of her students came to Baumgartner's aid and the two went shopping. According to Baumgartner, "...it took months. We visited six or seven dealers and wrote everything down. Then he used a spreadsheet program and gave me a print-out."

Baumgartner ended up buying six Apples and getting a seventh free as part of an educational discount. "But I didn't buy Apple because of the price," she says. "I bought because of the

Computing IN THE Humanities

Liberal Arts Enter The Computer Age

George Beekman and Steve Sakurai

The Macintosh, with its revolutionary user interface, is stealing the spotlight from older computers on campuses across the country. Perhaps more than any other computer, the Macintosh is melting the computer anxiety that's traditionally plagued non-technical college students and faculty.

Seven Jobs, one of Apple's founders, intended the Macintosh to be much like a household appliance—as easy to use as a telephone. Users relax when offered choices from menus and dialog boxes rather than having to supply syntactically correct and complete instructions. The "point and click" operation of the Macintosh gives students the freedom to concentrate on the task rather than the tool.

It's hard to believe that the Macintosh is little more than two years—four college semesters—old. Macs have quickly invaded campuses everywhere. A large part of this rapid growth can be attributed to the Apple University Consortium (AUC).

During the Macintosh's infancy, Apple Computer invited a number of colleges and universities across the United States to form a coalition dedicated to developing tools and resources for the Macintosh. Ultimately, 24 institutions were

selected to form the Apple University Consortium, among them Columbia, Stanford, Northwestern University, and the University of Washington. Some of the earliest software for the Macintosh was developed at AUC institutions. While the AUC was busy contributing to the pool of Macintosh software, the Macintosh was, in turn, busy changing the atmosphere at the AUC schools. Given free access to computers, students quickly overcame their apprehensions and began finding innovative uses for these powerful tools.

Macs On Campus

At Drexel University, where freshmen are required to purchase a Macintosh and where workstations are available around campus, the Mac is an accepted part of life. Drexel even has 2,600 dorm rooms wired with Appletalk which allows students to hook into a campus-wide computer network. Imagine checking facts and sources from the library, consulting with your instructor, and handing in your finished term "paper"—all without ever leaving your dorm.

Across the country at Oregon's Reed College, students aren't required to buy a computer, yet free-access Macintosh labs abound, and it's hard to find a student who isn't carrying at least one 3½-inch disk in a book bag. Flyers, party announcements, and MacPaint-generated For Sale ads are everywhere.

A hundred miles down the road

programs." She didn't even end up buying the equipment all through one retailer—she bought the computers from one store and the color monitors from another. "I had to have color," she said. "Kids these days are so used to color. You put kids in front of a black and white monitor, and they'd say, 'Are you kidding?'"

Apple software was brought to the attention of Baumgartner by the local Milliken Publishing Company saleswoman who brought a computer and several Milliken programs to Southminster school and left them for the kids to try out. "She encouraged me to let the children use them," says Baumgartner. "I learned an important lesson right away. A good program lets kids learn on their own. It doesn't require the teacher's constant attention. I brought the kids to my office to try the math series and language series programs she left, and they were up and running right away. The kids left my office 20 minutes later, and they had spent 100 percent of the time learning instead of trying to figure out the programs."

Teachers First

Baumgartner has had her Apple IIe's for a year and a half, and has set up computer classes in her office for all her children. But she has had less success with her teachers.

She works closely with the teachers to create lesson plans for the computers. The teachers make pencilled notations in the computer workbooks indicating which units relate to subjects they're teaching in class. And they write the dates when they'll be covering each subject. "If the fourth-graders are working on homonyms in September," says Baumgartner, "there is no point in my loading them on a machine in February."

Although the teachers are happy to let Baumgartner teach computers to their students, they're not excited about the prospect of using computers themselves.

"They are afraid that they will type the wrong key, and the program will go away," says Baumgartner.

If the teachers are afraid of the computers, it's unlikely that the computers will ever be used in regular classes. Baumgartner's six computers initially paid visits to different classrooms. But the computers distracted the kids, the teachers didn't use them, and they were moved back to Baumgartner's office.

Some schools have tried to deal with this problem by giving teachers the opportunity to use the computers *before* they're introduced to the students. At South Eugene High School, in Eugene, Oregon, for example, the first computers were bought exclusively for the teachers. South Eugene's full-time computer specialist, Tom Layton, trained the teachers on productivity tools, grading programs, and other software that would be useful to *them*, not to the students.

The school let the teachers take the computers home, and they did. But they soon got tired of moving the computers back and forth, and many decided to buy their own. That's when Tom Layton went to Apple Computer with a deal he thought they couldn't refuse. He told Apple "I can deliver 100 teachers, and we'll write you a check for \$250,000 if you'll give us a good enough price."

Apple came up with the right price, and Layton and his teachers bought the computers (mostly IIe's). As a result of this "teachers-first" policy, 75 percent of the South Eugene's teachers now own computers, compared to around five percent of the teachers in other school districts. Also, once the teachers became comfortable using computers, they were ready to bring them into their classrooms.

The teachers worked with the school to acquire 95 classroom Apple computers (mostly IIc's). "This doesn't sound like a lot," says Layton, "but it is when you hear that we did it without any state grants or any large blocks of money from the school district. Our computer money came from our regular budget. It was a sacrifice to have computers on the students' desks instead of new textbooks. But this is what the teachers wanted."

Teachers Training Teachers

Layton's "teachers first" program helped get things started in his school district. But how can schools maintain this initial momentum and keep their teachers up to date with the latest computer technology?

One successful strategy is to train teacher volunteers in a school and pay them to teach other teachers. The first teacher acts as a spark to stir up interest in new computer projects and as a consultant to other teachers who would like to learn computer basics or teach a subject with the aid of a machine.

This strategy has worked well in the 74 elementary schools, 23 high schools, and 12 education "centers" in suburban De Kalb County on the eastern edge of Atlanta. Frank Barber, De Kalb's Director of Educational Computing, began his program by training ten "instructional coordinators." Each coordinator was a senior person in their subject area or department, such as mathematics or social studies. The coordinators helped teachers set up computer labs and use computers in the classroom.

De Kalb, like Tennessee, wrote up extensive bid specifications for its first computers. Apple computer won the bid, as in Tennessee, because it was low bidder and was able to meet all the conditions.

When the 2,000 Apple computers first arrived at De Kalb schools, Barber followed the same strategy as South Eugene H.S., and focused on the teachers first. He and his coordinators first taught each teacher how to use the computers. Teachers learned how to keep their grade book on the computer, how to score tests, and how to do word processing.

But because of the size of the task, things bogged down. Barber and his ten coordinators were trying to train over 4,500 teachers who worked at 115 different schools and who themselves taught over 70,000 students. To solve this problem, Barber and his team went to each of the schools

and identified teachers who were enthusiastic about computers and interested in learning more. Teachers at the junior high and high school level were appointed as "Educational Computing Specialists" and given department chairman status and supplementary pay. One teacher in each of De Kalb's 74 elementary schools became a "Computer Representative" and was given certification renewal credit and credit toward the training needed for an annual three percent pay raise. According to Barber, "We gave teachers some real tangible benefits as incentives, and they responded enthusiastically. They run new training courses in all the schools. They act as consultants, computer advocates, and troubleshooters. This helps us keep up our program's momentum."

Barber recently did a county-wide survey and found that 54 percent of his teachers use computers for teaching at least some of the time. Says Barber proudly, "Our strategy is working."

Computer Literacy

According to Del Yocam, an Apple Executive Vice President, only five years ago there were fewer than 30,000 Apple computers spread out among over 100,000 schools.

When so few computers around, they were treated like exotic animals. They were set up in their own laboratories, and students came in to touch them, study them, and find out what made them tick. The major emphasis was on how the computers worked, not on what they could do. This was known as *computer literacy*.

According to Yocam, almost 75 percent of all students are still taking computer literacy courses. However, computer literacy has evolved into a different subject from what it was five years ago. For instance, at Southminster, in Birmingham, computer literacy means learning keyboard skills, doing computer-assisted instruction in language arts and math, and using the Apple II's (along with Brøderbund's popular *Print Shop* program) as school printing presses for banners, newsletters,

from Reed, the Oregon State University Library houses a bustling microcomputer lab and software information center. The lab is open to students of all disciplines, but it's used heavily by students in LS 190, a popular computer literacy class offered through the College of Liberal Arts. Unlike traditional computer literacy courses that focus on BASIC programming and hardware jargon, LS 190 is designed to teach students how to use computers through hands-on experience with *MacWrite*, *MacPaint*, *MacDraw*, *Excel*, *Microsoft File*, and other commercial software packages.

According to Rick Smith, director of the center and LS 190 instructor, the faculty committee which designed the course envisioned that it would eventually be a campus-wide requirement for entering students. But its popularity has exceeded the school's expectations and, although plans are underway to expand the offering, currently only seniors can expect to be admitted to the class.

Smith says that the course draws students from technical as well as non-technical disciplines. "The typical liberal arts student who takes the class is scared of

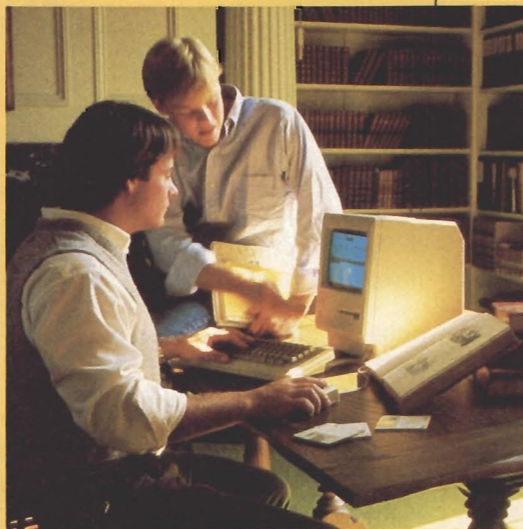
CS [Computer Science] people generally do better, because they do everything that's assigned."

The Liberal Arts College of the University of Oregon at Eugene has taken a broader approach to computer literacy, using computers in innovative ways in a variety of humanities courses. Consider English 199, *Hamlet on the Macintosh*. Students in this course don't just read and discuss *Hamlet*. They play with Macintosh Pascal as a tool for writing a *Hamlet* text adventure. They experiment with *Eliza*, the famous dialog generator, and consider what would be necessary to turn *Eliza* into a soliloquy-generating Prince *Hamlet*. Professor William Strange writes in *Wheels for the Mind* (an ongoing journal of Apple university work published at Boston College), "I have been teaching Shakespeare for some 25 years; I have seldom seen students more on fire for a play..."

Dr. Jay Ludwig of Michigan State University is putting his English students to work in a Macintosh lab as well. But the MSU students are using the computers to improve their writing skills. Five hundred students draft papers using *MacWrite* and then run them through a language analysis program called *MacProof*. The program flags potential errors in grammar and style, as well as possible sexist and racist references. *MacProof* doesn't tell students *what* to do, it merely suggests alternatives. Ludwig acknowledges that the program isn't perfect,

he's still delighted with the improving quality of student work since the lab was opened.

In Northern California, Macintoshes are kindling linguistic and cultural fires of a different tradition. Through the Humboldt State University Bilingual Emphasis Program, students and teachers are



Courtesy of Apple Computer, Inc.

computers, and is there because somebody said they need it." But these same students have no trouble holding their own in the course, even when competing with computer science majors. "Motivation is the big consideration; sex and major have little to do with performance. In fact, non-

greeting cards, and announcements.

In Tennessee, the computer literacy program consists of thirty 45-minute lessons for every seventh and eighth grader. The lessons are divided into six clusters of five lessons apiece. The clusters range from computer operations to the social impact of computer technology, computer ethics, programming skills, and computer applications such as databases, telecommunication, and word processing. In their final cluster, students play the role of consumers shopping for a new computer.

According to Dr. Kelley, some of the main benefits of Tennessee's computer literacy program are hidden. They include making students and teachers comfortable with the new technology and creating a new enthusiasm for learning in the school. Baumgartner of Southminster agrees: "The children love to come to computer class. They run to the computer, but they walk back to their classroom."

In South Eugene High School, computer literacy has centered around one program, *AppleWorks*, a productivity package which includes a word processor, a database, and a spreadsheet. "We've blown our budget for the last two years on *AppleWorks*," says Tom Layton. Teachers are using *AppleWorks*' spreadsheet to teach engineering and math, and its word processor to teach everything from economics to creative writing. The social studies teachers have been especially active *AppleWorks* users. They and their students have built several databases including one on the proliferation of nuclear weapons, a global country database, and a database on international terrorism.

"Our curriculum runs on one piece of software," says Layton. "All our training is on *AppleWorks*, so the whole school knows it. This makes it cost-effective. We get a lot of teaching out of only one package."

The concept of computer literacy has evolved, but what's happened to the original computer science labs?

Many schools have sent their lab computers into the classrooms or the media centers. Or they've converted their lab into a drop-in center, where computers are available to help students complete course assignments. South Eugene has set up a drop-in center for students to use during a free period or before or after school. Students come by and write an engineering paper or do a chemistry assignment on the computer. The home-economics teacher brings her students in for four-day

"We are preparing new courses for our high school students. The courses will emphasize business applications of computers, a technical perspective in math and science, and specialized courses in different subjects."

Dr. Kelley is also moving the computer-literacy courses from the seventh and eighth grade down to the fifth and sixth grades, and redoing the secondary courses that have been in place the last two years. "As the technology improves, we keep updating," he



Sean D. Elliot, South Eugene H.S.

At South Eugene High School in Eugene, Oregon, the computer literacy program is centered around one commercial program, AppleWorks, an integrated word processor, database, and spreadsheet package.

units on nutrition, the geography teacher reserves the center for workshops on mapmaking.

The New Generation

Many schools have had computer literacy programs in place for two to three years. What happens to the students who have graduated from the courses and are ready to begin using the computer as a serious tool? In Tennessee, for example, there are now 140,000 ninth graders who are computer literate. According to Dr. Kelley of Tennessee's Board of Education,

said. "Nothing is set in concrete—not even concrete."

It seems that four major trends have surfaced in the leading-edge schools that are moving beyond their original introductory computer literacy courses. First, they're offering computer courses to younger children. Second, they're training children to use the computer as a tool. Third, they're trying to integrate computers into the main curriculum. And fourth, they're attempting to reduce the student-to-computer ratio by acquiring more computers.

All four of these trends are

visible at the Blue Earth Elementary School in Blue Earth, Minnesota. Last year, fourth-grade teacher Sara Duden taught 26 children with 28 Apple IIe's networked to a Corvus hard disk with 45 megabytes of memory. Duden's class was one of 15 classes participating in the state-run Project Beacon which was trying to disseminate high technology in Minnesota schools. This year, the students from her class (now in fifth grade) are participating in Apple Computer's Classrooms of Tomorrow project. As part of the project, each student has his or her own computer in class and another computer at home. Apple is studying what effect all these computers will have on students' learning.

Duden is convinced that the computers had a major effect on her students last year—especially in writing. She began the year with a strong emphasis on keyboard skills. The typing teacher came by the class for an hour and a half each day for the first two weeks. She taught typing for half an hour a day for the next month, and she came by once a week after that up until Christmas. "She got us off to a good start," says Duden. "Even when she wasn't there, we concentrated on the keyboard."

Why all this emphasis on the computer keyboard? According to Duden, "It really paid off. Once the kids were good typists, they could use any of the computer's other tools. They didn't have to stop and think where the keys were. It really made a difference."

The biggest difference was in the children's writing skills. All the children used the Milliken word processor for the entire year. At the end of the year, the state of Minnesota evaluated the children's progress in several areas, including writing. State evaluators had the entire fourth grade (including Duden's class) write a 30-minute composition. The children had five minutes at the beginning to think about what they were going to write, then five minutes more at

working with children and tribal elders to develop illustrated phonetic dictionaries for Hupa, Yurok, and Karuk languages using special Macintosh fonts. Before this program began, these native languages were in danger of vanishing.

The Seeds Of Growth

Apple recognizes that one of the best ways to develop a large inventory of educational software is to plant computers in academia. One of the main goals of the consortium was to plant such software seeds. As one might expect, many of the AUC programming projects were aimed at the sciences. But a majority of the programs represent courseware for "soft" sciences and the humanities.

In Hanover, New Hampshire, John Appleton, a professor at Dartmouth College, has written two programs which introduce students to the fundamentals of music composition. *Mozart* is a program which allows students to construct minuets from pre-defined building blocks. Each building block is a two-measure phrase, composed by Wolfgang Amadeus himself. The students control the arrangement of the phrases, the tempo, and other musical aspects. The minuet may be played on the Macintosh's built-in speaker or saved to disk for later playback. An additional feature prints the music on the ImageWriter.

Another Appleton program, *AppleTones*, encourages the student to explore a number of elements of music composition. Pitch, duration, repetition, silence, volume, and timbre are all easily manipulated. Appleton, one of the developers of the SynClavier music synthesizer, has created a fertile playground for audio experimentation.

At California Polytechnic State University at San Luis Obispo, the music department maintains a database of over 4,000 melodies for baroque guitar. Using *1stBASE*, the melodies and related information—author, title, source, page, meter, time signature, key, and so on—are easily accessed—making it easy to search for those golden oldies by tune or composer.

At Stanford, students are able to plan the movements of a stage production in *The Theater-Game* program written for their Macintoshes. The student can design stages and characters, then plot the character's movements as the play progresses. Various movements—the direction each character is facing, how they move across the stage, when they turn away from or towards other characters—are charted. Then the choreography can be played back in realtime. Coupled with an audio recording of spoken text, the animation provides a graphic representation of how a production could be staged. *The Theater-Game* gives any budding drama student the taste of the director's chair.

Stanford's students in the theatrical arts are given additional opportunities in film storyboarding. Movies such as *Raiders of the Lost Ark* required extensive storyboarding—every scene, every change of view, and every camera movement was illustrated as a series of still sketches. The effect is like a comic book version of the movie, without the dialogue balloons. The use of two commercial products—Koala Corporation's *MacVision*, and Living Videotext's *ThinkTank 512*—makes storyboard creation a snap. The digitized pictures from *MacVision* are collected and redisplayed by using the "slide show" function of *ThinkTank*. The resulting images are the next best thing to the actual movie.

More Stories To Tell

If there's a shortage of authors in the near future, it won't be because Drexel University hasn't been doing its part. Drexel provides a variety of programs designed to coax better creative and technical writing habits out of its students. One tutorial helps students develop and organize ideas about literary works by asking questions, defining terms, and offering ideas to explore. Another exercise uses *MacPaint* images to make the student aware of the creativity associated with connecting visual images to descriptive text.

Drexel's %CREATE is a prewriting program which helps a student refine ideas about an article or paper. It assumes the student has selected a topic but needs to narrow its focus. By helping the student define the audience and purpose, the prewriting program provides direction for a writing project. To add detail and further organize the paper, a Drexel student can use the *Matrix Organizer* to put ideas on "index cards" on the screen. By rearranging these cards, the sequence of ideas and elements can be edited.

Several of the AUC schools, including Drexel and Dartmouth, have developed tutorial/drill programs which can be customized for almost any area. An instructor simply prepares a set of lessons consisting of informative text, questions and answers, and *MacPaint* graphics. The drill program then takes the student through the lesson. The drill may ask questions which can be answered by entering text or through mouse clicks.

Because such drill and practice programs can incorporate both graphics and text, they're ideal for coaching foreign languages. Usually, the drill program will display a *MacPaint* picture containing several objects. Then, by displaying a word (in the foreign language), the program can require the student to click on the correct object. By highlighting an object, the program asks the student to type the correct foreign word. In addition, the drill program asks questions and validates responses in either language.

The Macintosh has also prospered in foreign language departments because of its ability to display an infinite number of fonts. Among the AUC schools, fonts are available for almost any language, ranging from Greek and Gaelic to Arabic and Armenian. The Mac adds a nice touch to essays, examinations, newsletters, posters, and assignments in the foreign language departments.

And though *MacWrite* is still the Macintosh's primary word proces-

sor, there's been some action in the right-to-left word processor arena. Arabic and Hebrew word processors are available, for instance.

While the graphics capability of the Macintosh is valuable in drills and exercises, an even more inviting use of this visual power lets students roam freely on their own explorations. Carl Spitzer's *Atlas* program at Dartmouth College lets instructors load images, maps, or diagrams for viewing by students. Students can display the images, call up overlays, zoom into areas of interest to see more detail, and zoom out to gain perspective. *Atlas* can be tailored for use in any field, from history to biology to art.

The Future

Colleges and universities will continue to develop innovative educational software, and as new products hit the commercial market, they too will find a place on college campuses. Computers are becoming so important to the humanities that the University of Nevada at Las Vegas has created the Center for Computer Applications in the Humanities. The Center publishes a newsletter, *Computing the Humanities*, which is devoted to the use of computers (especially microcomputers) for the analysis and teaching of the humanities.

Things just aren't what they used to be for the liberal arts student. Five years ago, the typical liberal arts student tried to put as much distance as possible between him or herself and the nearest computer. Today it's far more likely that a university student in the humanities will not only be comfortable with, but will be actively seeking time on a computer. Much of the credit goes to the Macintosh. **aa**

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the end to conclude. Duden's children "word processed" their composition, the other fourth graders used pencils and paper.

Over the next month, the pencil-and-paper compositions were entered into the computer, and every composition was stripped of its name and circulated anonymously to language arts teachers in other school districts. The result? Duden's children scored higher than the children who did not use computers. But this wasn't what surprised Duden. She was amazed to find that the evaluators had correctly identified 21 of her 26 students by the quality and length of their compositions.

"They showed more enthusiasm for creative writing this year than any other year," she says. "And I attribute a good portion of that to word processing and the ease with which they could create, edit, and print things out. I'm not used to seeing that much enthusiasm."

But wouldn't all these computers tend to stifle the development of children's handwriting skills?

"Not at all," answers Duden. "We still worked on handwriting in class. And I think the word processing far outweighed the time practicing handwriting when I think of what the kids will be able to do with computers in the upper grades."

But weren't the students spending too much time on the computer and not enough time interacting with the teacher or with their fellow classmates?

"If anything," says Duden, "the kids felt more free to share what they were doing. They weren't glued to the computer screen. They moved around a lot and did lots of non-computer activities and talking with their neighbors."

"The thing I noticed the most," she continues, "was their motivation and self-confidence. Gaining self-confidence at this age is very important. They were not the least bit hesitant to sit down at the computer and try anything. And when we had visitors to our class, I was surprised at how well the children communicated and expressed their ideas to the adults. By the end of the year they were just as self-confident and ready to share as anyone I've ever seen."

David And Goliath

Looking into the future, Talmis's Anne Wucjik sees several trends affecting computer use in the schools. Schools will be looking for new software and more memory for their computers. They will be experimenting more with CD-ROMs and videodisk systems, with full-fledged, computer-managed instruction, and with what Wucjik calls "full-service computing." Schools will want computer manufacturers to furnish them with a complete package of hardware, software, and applications. The package will include things like instructional software, productivity tools, online search capability, databases, and networking.

One of the major trends among such leading-edge schools is toward higher-level computing, involving minicomputers and mainframes. Stand-alone microcomputers are being replaced by octopus-like networks of big computers connected to dozens of smart or dumb terminals.

According to Tom Layton, a real battle is shaping up between the makers of microcomputers and the minicomputer and mainframe manufacturers. "It's also a fight between local school districts and the downtown administration," says Layton. In Eugene, Oregon, city administrators have bought a high-speed VAX minicomputer and are trying to offer this as a central computing facility for all the school districts. But schools with a large investment in microcomputers, like South Eugene High School, are fighting this. "It's a battle between David and Goliath," says Layton. "The city wants to buy a multi-million-dollar machine and hire eight university-trained DP professionals.

"Then they'll tell us that all of the school districts have to do everything the same way or the mainframe can't handle it.

"We're pitting our little whizbang computer against their dinosaur," he says. "It blows their

minds that we have all our systems up on a little 128K Apple IIe. The city hired a high-powered consultant to come into our school and evaluate our attendance system on the IIe. They wanted him to say it was a piece of junk, but he loved it. He saw that it was in structured Pascal, it was expandable, it had a Corvus hard disk with megabytes of memory and a Scantron wand for bubbling in kids who are absent. It even had an automatic phone-dialer to call parents and tell them that their kids weren't in school. The city's big computer couldn't touch it."

Apple's Worries

Apple's Sue Talley is pleased with Apple's success in the schools. But she has two worries. She's afraid that Apple's computer sales may slow down or stall due to what she calls "artificial saturation." This occurs when schools feel that they have enough computers and enough software, and they decide to spend their money on other, more pressing, priorities like textbooks, new buildings, or teacher's salaries.

Her second worry is over cities' and states' increasing scrutiny of schools' computer purchases. Many school systems are spending hundreds of thousands or even millions of dollars on computers. The Houston school district, for example, has spent over a million dollars a year in each of the last three years and employs a staff of 150 people in its Department of Technology. State legislators and city officials are now looking into these expenses and asking why so many of the contracts are going to Apple. And they are asking to see the results of such enormous expenditures.

"Policymakers are challenging school administrators to prove that computers have significantly improved education," says Talley. "But this is usually impossible because the ratios are so bad. There are fewer than two million computers in over 100,000 primary and secondary schools. That's about one computer for every forty students. And, on the average, a student gets only half an hour on the computer each week.

That's not enough to make a difference."

The Price Of Success

Apple would like schools to begin moving to their high-end machine, the Macintosh. But few primary and secondary schools are making the move. "There is almost no interest in the Macintosh," says Tom Layton of South Eugene High School. "We have 95 IIe's and IIc's and only one Mac. I've been trying to develop interest in the Mac, but the installed base is killing me. Everything runs on the II's. The teachers have been trained on the II's, they are comfortable with the II's. They say, 'I don't care. My machine does everything I want it to now. I don't need a Macintosh.' My only break is with the foreign languages. The Russian teacher can have Russian on the Mac, the Japanese teacher can have Japanese on the Mac."

But having such a large installed base also benefits Apple. First, it makes all the schools who own Apples turn to Apple first when they buy new machines, new equipment, or software. And it has a significant effect on the students who, after all, are the next generation of computer consumers. Layton did an informal survey in his school in Oregon, for example, and he found that 45 percent of South Eugene's students owned computers, and among computer owners, 70 percent owned Apples. "This is a dramatic rise over last year," says Layton. "Then the kids' computers were all across the board. There was everything from Timex-Sinclairs to VIC-20s. Now it's all Apples.

"I've been an Apple watcher for years," says Layton. "And sometimes trying to figure them out drives me crazy. I don't know whether they're lucky, a bunch of fools, or what. But they've been smart to support education. And they'd be even smarter if they supported education more." **aa**

Fred D'Ignazio is an Associate Editor for COMPUTE! magazine, a regular commentator on PBS's program Educational Computing, and author of numerous books, including COMPUTE!'s Computing Together (COMPUTE! Publications).

Buyer's Guide

To Educational Software

As noted elsewhere in this issue (see "Apple Rules The Schools"), Apple's reputation in education is well deserved. No other computer line—from the Apple II-series to the Macintosh—can run as many educational programs. New software for the market makes this even more evident.

As educational computer users become more sophisticated, so does the software. The recent swing from teaching computer science to using Apples to enhance discipline-wide learning is gathering momentum. Some of the new software shown here reflects that change, for more *applications* are showing

up in the classroom. Writing applications, spreadsheet applications, even personal publishing applications, are making a strong appearance. In fact, there seems to be more and more cross-over between the educational and business software categories.

The programs listed here are just some of those released since the beginning of August, 1985. The buyer's guide isn't exhaustive, but it does give you a sampling of what's available.

Note that prices and machine availability often change, sometimes even as such guides are compiled.

The data for this guide was supplied by .MENU—The International Database Corporation. For further evaluative information and ordering, or to insure that your product is included in the database, contact .MENU, 1520 South College Avenue, Fort Collins, Colorado 80524. The toll-free numbers are 1-800-THE-MENU, and 1-800-MAC-MENU, or 303-482-5000 outside the United States. When ordering, note the International Standard Program Number (ISPN).

Product	Price	ISPN	Publisher/ Vendor	Systems	Description
Language Arts					
Add Reading Skills	\$49.95	38887-008	Intellectual Software	II, II+, IIc	Reading comprehension exercises with adjustable degrees of difficulty. Grade 2-3.
Best Electronic Word Book Ever!	\$19.95	11670-038	CBS Software	II+, IIc, IIc	Practices fundamental reading skills. Dozens of storybook characters in six environments.
Bounty Hunter	\$39.95	50225-073	Micro-Ed	II, II+, IIc	Develops visual observation and visual memory skills. For grades K and up.
Business Resume Preparation	\$24.95	48312-100	Gregg Division/ McGraw-Hill	II+, IIc, IIc	Produces professional-looking resumes.
Capitalization Machine	\$49.95	75075-090	Southwest Edpsych Services	II+, IIc, IIc	Covers capitalization skills typically taught in grades 2-10.
Developing Writing Skills	\$115.00	38887-160	Intellectual Software	II, II+, IIc	An introductory tutorial and drill on writing effective sentences and paragraphs.

Product	Price	ISBN	Publisher/ Vendor	Systems	Description
Editor	\$39.00	54725-049	Minnesota Educational	Ile, Iic	This package of five programs focuses student attention on the revision stage of the writing process. For grades 7-12.
Greek Mythology	\$39.95	27050-424	Dynacomp	II +, Ile, Iic	Relates most commonly-told legends of the gods of Mt. Olympus and looks at the influence of Greek mythology on art and literature.
Hide 'N Sequence, Senior High	\$69.00	77038-404	Sunburst	II +, Ile, Iic	Helps students make the vital connection between thoughtful reading and effective writing.
Jungle Book Reading	\$29.95	30848-425	Fisher-Price	II +, Ile, Iic	Reading comprehension program for ages 7-12. Characters and stories from Kipling's tales test and improve children's reading abilities. Special words are spoken by the computer.
Kid Pro Quo	\$39.95	72240-285	Softsync	Ile, Iic	An illustrated word processor for ages 8-14. Write stories, illustrate and animate them, even compose musical accompaniment. Includes libraries of figures and songs.
Magic Spells	\$34.95	43870-425	Learning Company	Ile, Iic	This new version, in Unidisk 3.5 format, includes over 500 words and an easy-to-use editor for creating custom word lists. Unscramble words and reproduce flashed words.
Master Spell	\$59.00	54725-667	Minnesota Educational	II, II +, Ile, Iic	This utility package allows you to enter word lists and design spelling lessons to meet individual needs. For grades 1 to adult.
Newsroom Scholastic Edition	\$74.95	68075-479	Scholastic Software	II +, Ile, Iic	Spark student's imagination, sharpen their writing and organizational skills, to turn out professional-looking newspapers and newsletters.
Paint with Words	\$29.95	54725-735	Minnesota Educational	II, II +, Ile, Iic	Create imaginative pictures while expanding vocabulary. For ages 4-8.
PFS: Literature and Composition	\$124.95	68075-426	Scholastic Software	II, II +, Ile, Iic	Contains data files designed to help students develop literary research skills as they track down information. For grades 7-12.
Perplexx	\$39.95	34925-59	Hayden Software	Mac	A four-level Scrabble-like game. Play against a friend or the computer, which has a 90,000-word dictionary. Three board sizes and player-assigned bonus squares.
Practical Vocabulary	\$54.95	64387-554	Queue	Mac	Vocabulary drill on recognition and use of vocabulary, definitions, antonyms, synonyms, word roots, and prefixes. High school level.
Word Order German—Beginning	\$37.95	32819-830	Gessler Educational Software	II +, Ile, Iic	A creative interactive program that teaches the linguistic patterns of sentences.
Word-A-Mation	\$59.00	77038-930	Sunburst	II +, Ile, Iic	A challenging vocabulary game where students, grades 4 through adult, learn about synonyms, antonyms, homophones, tense, and more.
Math					
Adding with Objects	\$10.95	50225-016	Micro-Ed	II +, Ile, Iic	Add two groups of objects, each nine or less, either by counting or identifying the sum of their numerals. Grades K-1.
Alge-Blaster!	\$49.95	24075-25	Davidson & Assoc.	II +, Ile, Iic	A comprehensive math program for pre-algebra and algebra students. Covers positive and negative numbers, monomials and polynomials, factoring, and equation solving.
Algebra 1	\$30.95	28087-012	Eduware Services	II, II +, Ile, Iic	One in a sequence of six independent volumes. Includes definitions, number line operations, sets, and evaluating expressions.
Arithmetic-Tac-Toe	\$34.95	38887-056	Intellectual Software	II +, Ile, Iic	Students have fun practicing and strengthening their arithmetic skills in addition, subtraction, multiplication, or division.
Campaign Math	\$39.99	54362-300	Mindplay	II, II +, Ile, Iic	Introduces math and the election process. Teaches ratios, fractions and percentages. Ages 9 to adult.
Circus Math	\$49.00	54725-015	Minnesota Educational	II, II +, Ile, Iic	Circus characters inspire children to solve addition problems involving up to four digits and three addends. For grades 2-3.
Equations: Advanced Level	\$49.95	86256-305	Wif 'N Proof	II, II +, Ile, Iic	Explores exponents, roots, and logarithms with whole numbers, integers, fractions, and irrational numbers.
Fat Chance	\$17.95	50225-179	Micro-Ed	II +, Ile, Iic	Predict the chances of a random number being a multiple of a given number. For grades 3-9.
Figuring the Angles	\$17.95	50225-182	Micro-Ed	II +, Ile, Iic	Estimate, with increased accuracy, the size of acute and obtuse angles. For grades 4-9.
Galaxy Math: Volume 1 Basic Math Facts	\$29.95	65140-225	Random House	II +, Ile, Iic	Practice addition, subtraction, multiplication, and division of single-digit numbers. For grades 2-4.
Geometry	\$60.00	70949-077	Sliwa Enterprises	II +, Ile, Iic	Development and review of fundamental theorems and problem solving techniques for plane geometry. For grades 8 through adult.
Graph	\$49.00	54725-601	Minnesota Educational	II, II +, Ile, Iic	This simple, flexible tool does the tedious work of drawing graphs. For grades 7-9.
Honors Calculus	\$39.95	66150-137	Resource Software International	Ile, Iic	Provides two sections of exercises covering advanced calculus problems. For grades 8-college.

Product	Price	ISBN	Publisher/ Vendor	Systems	Description
How Many	\$34.95	64387-355	Queue	Mac	Introduces young children to counting, number recognition, addition, and subtraction.
How To Weigh An Elephant	\$19.95	43896-115	Learning Technologies	II+, IIe, IIc	Develops concepts of weight/mass/volume, ordering and sequencing, observation/prediction of outcomes, cause and effect relationships.
Junkfood Shopping	\$49.95	38887-306	Intellectual Software	II+, IIe, IIc	A long story problem where children use their skills in subtraction, addition, multiplication, and estimation.
Math Shop—Home Edition	\$39.95	68075-481	Scholastic Software	IIe, IIc	Students use spreadsheets to solve word problems in simulated settings. For grades 6-8.
Number Circus	\$16.95	27050-519	Dynacomp	II+, IIe, IIc	Motivate children 4-6 in learning counting, addition, and subtraction.
Numbers, Letters, and Shapes—Part I: Easy as 1,2,3	\$35.00	50550-585	Micro Learningware	II, IIe, IIc	Seven games involve numbers, each using a different approach. The games introduce children to numbers on the keyboard, and more.
Peanuts Math Matcher	\$39.95	65140-295	Random House Electronic	II+, IIe, IIc	Build basic math skills in lively games with animated graphics. For children ages 7-11.
Pinball Math	\$39.95	28525-458	Electronic Courseware	II+, IIe	An educational computer game for students learning the basic operations of addition, subtraction, multiplication, and division.
Robomath	\$39.99	54362-650	Mindplay	II, II+, IIe, IIc	A robot-filled arcade game that teaches multiplication and division. Ages 8 to adult.
Webster's Numbers	\$39.95	28087-930	Eduware Services	II, II+, IIe, IIc	Creates a magical environment in which the fundamental concepts of numbers become exciting adventures.
Science					
Astrostell	\$29.95	87368-225	Zephyr Services	II+, IIe, IIc	Eighty-eight constellations included, plus the deep sky objects they contain.
Bio*Cell	\$29.95	87368-280	Zephyr Services	II+, IIe, IIc	An introduction to the biology of cells, this program explains cell structure to grades 7 and up.
Body In Focus	\$39.95	11670-085	CBS Software	II, IIe, IIc	Young biologists now journey through the inner workings of a human body. A graphically-detailed account of the anatomy and functions.
Chemistry Series	\$125.00	70949-036	Sliwa Enterprises	II+, IIe, IIc	This series covers topics discussed in high school chemistry curriculum. For grades 8 through adult.
Cometwatch	\$29.95	87368-360	Zephyr Services	II+, IIe, IIc	Three calculations that plot any comet orbit with planets, time plot of Earth and Comet Halley for any return, and more.
Dinosaur Days	\$39.95	27050-239	Dyancomp	II+, IIe, IIc	Contains two disks full of information on dinosaurs and their environment.
Earthquake	\$12.95	50225-163	Micro-Ed	II+, IIe, IIc	Find the epicenter of an earthquake, given a set of shock waves. For grades 6-9.
Genetics	\$49.00	54725-595	Minnesota Educational	II, II+, IIe	Two programs help teach students the rules of genetic traits and blood typing. For grades 6-9.
Macanatomy	\$285.00	45845-620	Macmedic Publications	Mac	A complete electronic atlas of human anatomy on disk in MacPaint document form.
Oil Rig	\$29.95	50225-526	Micro-Ed Inc.	II+, IIe, IIc	Discover oil with data provided about underground rock formations. For grades 7-12.
Periodic Charts of the Element: Filevision Template	\$29.95	30470-500	Expertec	Mac	Templates designed to be interactive, educational teaching aids for students in elementary chemistry studies.
Physical Science	\$124.95	60875-476	Scholastic Software	II, II+, IIe, IIc	Enables students to gather and organize information in different ways, become more creative in problem solving. For grades 7-12.
Sir Isaac Newton's Games	\$59.00	77038-755	Sunburst	II+, IIe, IIc	Learn about velocity, acceleration, and friction in this five-part simulation game.
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Social Science					
Balance of Power	\$49.95	54375-36	Mindscape	Mac	Impressive geopolitical simulation of USA-USSR confrontation. Insurgencies, coups, diplomacy, crisis management, economic aid, destabilization, treaties and more. Avoid nuclear war while enhancing prestige.
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Nation	\$19.95	27050-524	Dynacomp	II+, IIe, IIc	A contemporary strategy game that puts you at the head of your own island nation. Govern millions, make decisions in all areas, from war to industry.
Other Side	\$69.95	82206-575	Tom Snyder Productions	II+, IIe, IIc	Conflict negotiation game where children and adults experience how conflict evolves and the ways in which two opposing sides negotiate and eventually compromise to achieve a common goal.

Product	Price	ISBN	Publisher/ Vendor	Systems	Description
PFS: World Geography, Cultures, and Economics	\$124.95	68075-770	Scholastic Software	II+, IIe, IIc	Gives students a global learning opportunity and helps sharpen research and analytical skills. For grades 7-12.
Art and Music					
ColorMe: The Computer Coloring Book	\$29.95	54375-37	Mindscape	IIe, IIc	Children can design and print their own pictures, coloring books, and stickers. Apple ImageWriter II color compatible.
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The Print Shop Companion	\$39.95	8850-126	Bröderbund	II+, IIe, IIc	Enhancements to <i>Print Shop</i> , this package includes a graphics editor, new typestyles and border designs, creature maker, and the ability to clip art from other graphics programs.
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Little Computer People	\$39.95	837-160	Activision	IIe, IIc	A little person lives inside each Apple, and this program shows himself, his house, and his dog. Watch him eat, sleep, read, and exercise. Talk to him, send him food, books, and records. Fun for ages 3 and up.
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The Works!	\$69.00	30838-820	Grolier Electronic Publishing	II+, IIe, IIc	This school edition includes a teacher's guide and 35 Blackline Masters for extended off-computer activities. Thirteen separate modules ranging from a typing teacher and letter writer to calendar pad and address book give students a wide-range of computer applications. aa

Reviews

Andrew Tobias' *Managing Your Money*

Bob Guerra

Most of us will probably never sink \$100,000 into municipal bonds, buy futures contracts on 5,000 bushels of beans, or have to worry about cataloguing a collection of valuable impressionist paintings. Simply getting all the bills paid each month and balancing the checkbook is as close as many of us come to the world of high finance. Even so, managing a household on a tight budget can often be as challenging as speculating on precious metals. Fortunately, no matter which end of the personal finance spectrum you find yourself in, *Andrew Tobias' Managing Your Money* may be the only software package you'll ever need to help you create order out of financial chaos.

Managing Your Money is comprised of nine integrated sections which allow you to organize every aspect of your personal finances from simple monthly budgeting and checkwriting to long-term insurance planning and portfolio management. One of the ways this package makes managing your finances easier is by automatically sharing information among its nine sections, or "chapters," as they're referred to in the user's manual. Depending on the number of transactions you record each month, this feature could save you a lot of time. For example, if you use the Budget and Checkbook section of *Managing Your Money* to write a check as a donation to your favorite charity, not only is your electronic checkbook automatically updated and the information passed along to the budget you've set up, but all relevant data is also sent to Schedule A of the program's Tax Estimator, as well as to a section

which tracks your net worth. Instead of entering the transaction four times, you enter it once and your computer does the rest.

HELP!

In addition, *Managing Your Money* also includes a twenty-minute on-screen tutorial called "Hello New User"; a Reminder Pad, so you'll never forget another important date; a Financial Calculator that lets you easily analyze loans or evaluate tax shelters; a section for insurance planning to help you assess your family's life insurance needs; and a sophisticated Portfolio Manager that allows you to keep track of all types of investments from rare stamps to real estate.

While the tutorial will tell you virtually everything you need to know to use the program, there are also several help screens available which can be called by simply pressing the Escape key. Not only do the numerous help screens answer many of the questions you might have about using the program, some of them even include financial advice and tips on useful tax strategies.

To make your first encounters with *Managing Your Money* even easier, there is a complete set of financial data (for a fictional family called the Samples) already entered into the various sections of the program. By snooping through the Samples' budget, portfolios, and bank accounts, you'll quickly learn how to set up your own records. When you're ready to begin, all of the sample data is easily deleted.

Each time you boot up *Managing Your Money*, you're asked to

enter the current date. Then, it's on to the Main Menu where you can choose any section of the program. If you select the Reminder Pad, the program will search your data disk for any pressing reminders based on the date you entered. You're then given the opportunity



The Budget and Checkbook section of *Managing Your Money* lets you specify the category, type, amount, and tax category of each item. Menu choices appear at the bottom of every screen for easy access.

to add future reminders. As reminders are entered, you can classify them as one-time, monthly or yearly, and specify the number of days advance warning you'd like to receive. It's up to you to remember to use the program often enough to avoid missing any important reminders.

If you have a stack of bills to pay, you may instead choose to go directly to the Budget and Checkbook portion of the program. Checks you write regularly can be set up as "automatic" transactions and stored—complete with addresses. *Managing Your Money* automatically alphabetizes these transactions and allows you to print them with just a few keystrokes using continuous form, magnetically encoded checks. (The user's manual recommends three companies from which these can be ordered along with accompanying window envelopes).

As April 15 approaches, you

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ESSENTIAL DATA DUPLICATOR 4

Reviews

can use the program's Income Tax Estimator to examine and compare various tax strategies. All you have to do to see one of the available schedules is press its letter—A, B, C, D, E, F, G, or W. But remember that although *Managing Your Money* allows you to print a report of gains and losses from Schedule D, it can't be used to actually prepare your return.

Some of the other reports which you can print with *Managing Your Money* include lists of reminders, unreconciled checks, loan amortization schedules, lists of several types of assets, balance sheets, and various budget reports. There's even a Print Screen feature that can provide you with a hard copy of any screen in the program.

On The Other Hand

Although *Managing Your Money* is one of the most powerful and comprehensive financial planning packages currently available for the Apple, it's not totally free of shortcomings. One is the user's manual. While the manual is well-written, it's only a supplement to the onscreen tutorial, highlighting the best features of the package. Even though the excellent tutorial tells you all there is to know about using the program, I would have liked to have seen this information duplicated in the manual. Also, the Glossary/Index at the back of the manual could be much more extensive.

The only other possible complaint is speed. While performing some large calculations with an unexpanded Apple II, the program operates slowly. If you have an Apple II Memory Expansion Card, however, this is not a problem. Also, the added memory allows you to experiment more freely with hypothetical data by letting you decide whether or not you wish to save the information

you've entered as you leave a section of the program.

These minor problems aside, *Andrew Tobias' Managing Your Money* is a worthwhile investment for both penny-pinchers and high-rollers alike. While it probably won't make you a millionaire overnight, it can help you gain control of your financial situation and make the most of your assets.

Andrew Tobias' *Managing Your Money*
Apple IIe or IIc with 128K, 80-column monitor, and two disk drives. Both 5¼- and 3½-inch disk formats included.
Micro Education Corporation of America
285 Riverside Avenue
Westport, CT 06880
\$199.00

Balance of Power

Gregg Keizer, Editor

*You have ignited a nuclear war.
And no, there is no animated display of a mushroom cloud with parts of bodies flying through the air.
We do not reward failure.*

Unfortunately, you'll probably see this message more than once when you play *Balance of Power*, Chris Crawford's new geopolitical simulation for the Macintosh. You've managed to end the world, or at least the world which existed inside your computer.

Indeed, *Balance of Power* does not reward failure. It also doesn't reward impatience, aggressive behavior, or rampant military adventurism. What it does reward is your skill, your strategic planning, and your knowledge of the game-world's situation. Most importantly, it rewards you with an outstanding simulation of super-power conflict resolution, one

that's so impressive in its execution that though you may waste hours playing a game to that black-screened conclusion, you'll come back for more.

This game almost never saw the light of day. Crawford, designer of classic computer games such as *Eastern Front*, had problems selling this. Mindscape, however, decided to pick it up. That's fortunate, for this is one of the best simulations available, on any computer.

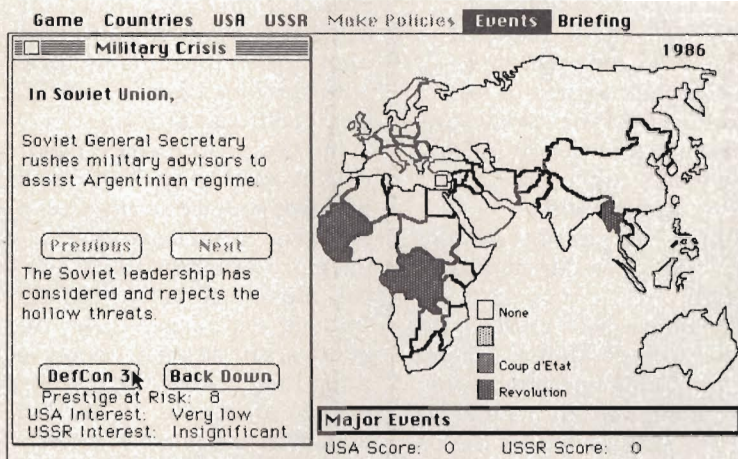
First Term President

Four levels—Beginner, Intermediate, Advanced, and Nightmare—are offered by *Balance of Power*. Each succeeding level presents more sophisticated methods for dealing with the opposition, more information, and thus more complexity. One or two people can play the game, though even the manual mentions that the human versus computer version is preferable. Playing against the computer adds uncertainty—it's easier to "read" a human opponent than the Macintosh. (The computer has less of a conscience, it seems, than most people.)

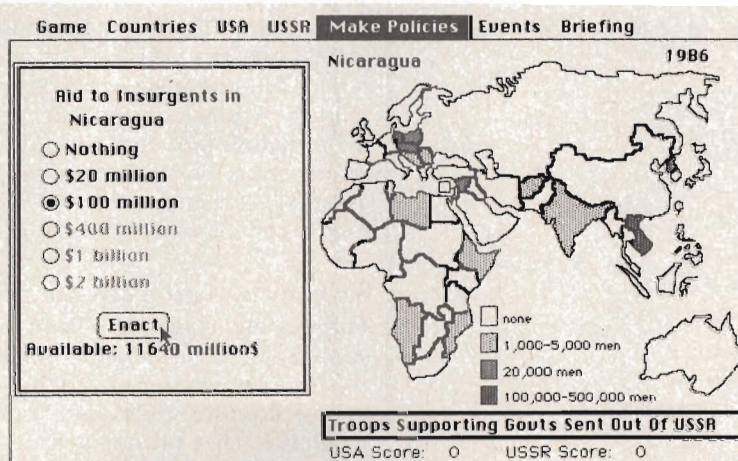
The first thing you'll see is the map display, interesting in its own right. Sixty-two of the world's 150 nations are represented, and a string of menus runs across the top of the screen. Though you'll be clicking on countries, most of your business is handled within the menus and their choices.

This is a bi-polar world—one player takes the USA, the other the USSR. China, a superpower in its own right, and other influential nations such as India, France, or Japan, are pieces in the game, not players.

Simply put (and this is definitely a simplified version of the game's play) you're trying to limit your opponent's global popularity while enhancing your own.



Tensions run high early as the USA player challenges the Soviet move to place advisors in Argentina. DefCon 3 has already been reached, and war could be but two steps away.



Behind, the USA player decides to increase the aid to the Contras. The map displays shows the scope of Soviet military involvement around the globe.

Avoiding nuclear holocaust, is, of course, also part of your game plan. To do this, you're attempting to topple unfriendly governments, install ones more likely to see things your way, and in the meantime keeping any friendly governments strong. In the beginner level, you have two offensive and two defensive options. Offensively, you can offer aid to insurgents in any country (every country has an insurgency of some sort—the USA's insurgency

is listed as the *Democratic Party*) or intervene, with troops of your own, on the side of the insurgents. Defensively, you can offer aid to a government, or intervene for that government. You select, within some restrictions of nation location and allegiance, the amount of money or personnel to send. All you have to do is last eight years (or turns). Sounds simple.

It's not. You must identify the friendly governments and insur-

gencies, find where the opposition (you can play either side, though you'll probably stick with the USA—most of us know far more about our political goals and methods than the Soviets') is aiding and abetting insurgencies and governments, then decide on some sort of policy. Added to all this are developing crises.

Crisis Management

Crisis management is vital to staying in the game (much less winning). Any action by you or your opponent can result in an escalation of world tension. When you first play the game, in fact when you start every new turn, it's always best to see what the other player is up to. Selecting *USSR actions* from the *Events* menu opens a window. You can read each Soviet action, decide to let it go or challenge it. Now it gets sticky. Challenge the Soviets' movement of troops into Angola, for instance, and they may back down. More likely, however, they won't. Pressing them on the matter quickly brings prestige points, the "score" of the game, into the situation. If diplomatic pressure doesn't work (after a challenge or two), then the military alert status starts to change. Keep pushing, and each country raises the stakes, moving from DefCon 5 (Peace) to DefCon 1 (War) a step at a time. And the prestige points increase, too, making it hard to back down (always an option) when there are two or three hundred up for grabs. The game is won or lost here, for the amount of prestige points which can change hands in a matter of moments far outnumbers that available by bringing countries to your political "side."

A vast amount of information is at your call, ranging from newspaper-like accounts of each nation to the kind and level of

Reviews

aid each country receives. Menus titled *Make Policies, Events, Briefing, USA, USSR, and Countries* all have several possible selections. All are easy to use, and self-explanatory for the most part. You'll find much of this information useful, some of it necessary, to make the best decisions. It does little good, for example, to support an insurgency that's getting even more money or personnel from the other side.

The beginning level's just that, and you'll quickly want to move on. The intermediate level gives you subtler tools to work with. Two offensive "weapons"—destabilization and coup d'états—are now at your disposal. Defensively, you can offer economic aid to stunt any possible coup d'état. These subversive activities are open to both powers, so while you're bringing one government to the brink of a coup d'état, you must pump money into another to keep the enemy from collapsing that government. It quickly gets complicated.

The Advanced level adds the concept Finlandization, the peculiar self-preserving habit of nations to adjust their politics to strong, hostile neighbors. Diplomatic pressure is your weapon, treaties your shield.

(The Nightmare level is identical to the Expert level...except that "the computer will be ruthless and unyielding." I didn't have the stomach for it.)

Put all this together and you have a simulation that's as complex as any you've seen. Not hard to play, really, just difficult to digest if you've been raised on shoot-'em-ups. Absolutely fascinating, though, and worth every moment spent playing.

No More War

In fact, that's what makes players keep their fingers off the red but-

tons. If you have six hours invested in the game (I averaged about one hour for each of the game's eight turns), you're less likely to throw all that away simply because the Soviets want to put advisors in Argentina. In a game, the only investment you have is time—this part of *Balance of Power*'s design is particularly intriguing.

There's much more to *Balance of Power* than can be hinted at here: troop and money limitations, the inability to support an insurgency because it's surrounded by the enemy's clients, the ease with which the Soviets seem to get their way. Everything's here. This simulation may not be *exactly* what a president or premier faces, but it's as close as most of us will ever want to get.

Balance of Power
128K Macintosh
Mindscape, Inc.
3444 Dundee Rd.
Northbrook, IL 60062
\$49.95

Fantavision

Lee Noel
Assistant Editor/Art and Design

The recent highly successful re-release of Walt Disney's 101 *Dalmations* attests to the enduring popularity of the animated cartoon. Although animation finds applications in fields far removed from movies and Saturday morning cartoons, these examples of the animator's skills are probably the best known. Most of us have fond memories of a favorite character or of a magical sequence that clearly disproves the notion of impossibility. Indeed, part of the ap-

peal of animation is its ability to bring fantasy to life, and there are many among us who've toyed with the idea of trying our hand at this difficult artform.

But it's the difficulties that usually turn us back. Animation achieves its wonderful illusions by stringing together a series of static images that mimic the stages of real motion. Rapidly flipping through the images tricks the eye, and we can be made to see anything imaginable. What's not so easy to imagine is the work involved in the process. Even a few minutes of animation may require a sequence of thousands of painstakingly created images. And for convincing animation and the smooth flow of motion, each and every one of these images must mesh and blend with its neighbors. Thus the mechanics of animation require not only an overwhelming quantity of graphic information, but also the ability to assemble it into precise and highly repetitive patterns.

Tweening And Transforming

Fortunately, computers have turned out to be rather good at this kind of work—providing, of course, that the right software is available. That brings us to *Fantavision*. Published by Brøderbund for the Apple II family of computers, this animation program reduces the aspiring animator's workload to the absolute minimum. Brøderbund's packaging makes several allusions to *Fantavision*'s near-magical properties, and a few minutes spent with the program will probably convince even the most cynical observer that there can be truth in advertising.

At the heart of *Fantavision*'s remarkable power is its ability to "tween" and "transform." Tweening is the automatic production of a number of the individual

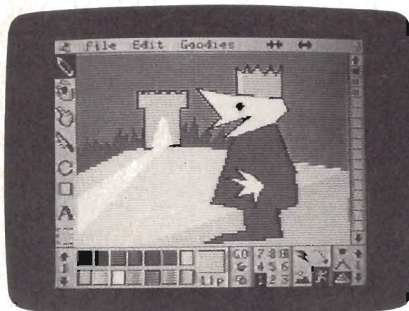
frames of animation, while *transformation* is the smooth metamorphosis of one image into another. For example, *Fantavision* can "transform" a lowly frog into a handsome prince, and at the same time "tween" the character between changes of location and posture. All the animator needs to do is supply drawings for the beginning and end of the sequence. *Fantavision* then generates the intervening frames automatically and virtually instantaneously. Watching the program dynamically animate between two very dissimilar end points does verge on the magical, but it's probably only a tour-de-force of programming ingenuity.

Intervention

And that's only the automatic part of the program. *Fantavision* provides an excellent artistic environment for the creation of those few frames where human intervention is necessary. These endpoint images—like signposts along the path of animation—are drawn, colored, and recorded in a Macintosh-like image processor. Most of the many tools and features are selected from a fast and effective array of icons and pull-down menus. These can be activated by mouse, graphics tablet, KoalaPad, or joystick. Recording is accomplished by simply clicking on to the next frame number—this drops the display into memory as the previous frame. As might be expected with this product, the feature-laden system is accompanied by clear and attractive documentation that could well serve as a model for less thoughtful software publishers.

Although many of the now-familiar drawing tools—rubberbanding lines, boxes, circles, undo, cut, copy, and paste—are available, some brilliant newcomers make an appearance. *Zoom*,

Lean and *Squash* merit special attention. *Zoom* is used to shrink or expand an image shown on the screen, giving the impression that objects are zooming toward or away from the viewer. *Lean* separates superimposed objects of different priorities. This probably



This animated prince will soon transform himself into a frog through the magic of Fantavision's "tweening" abilities.

won't mean much until you've used the program, but it makes the creation of illusion-enhancing shadows very easy. *Squash* allows you to flatten anything you've drawn, even to the point of reducing it to a line. These features may strike you as somewhat strange, but with a little thought they can be used to produce a complex animation from just one drawing.

Numerous other line-oriented and animation-specific tools abound, but they're best explored when actually using the program. A full set of file and disk utilities is built into *Fantavision*, and some fairly impressive demonstration animations are supplied on the second side of the program disk. The program has the capability of creating self-booting disks which will play your animations, making it easy to share your creations with anyone who has an Apple II computer. You can also load—and

use as backdrops—hi-res screens created with other graphics utilities.

Always A Price

But the wonders of *Fantavision* are not achieved without some cost. The striking transformations it effects are made possible only by setting certain limits on the objects it manipulates. The program appears to work by keeping track of the line segments and vertices which make up displayed objects. This is a significant task, considering the speed and smoothness with which the system operates. As a result, each frame is restricted to a maximum of eight objects, each of which can have a maximum of 32 vertices. These limits tend to impose a chunkiness and certain lack of detail on the resulting graphics. Careful design of backdrops and clever use of *Fantavision*'s many features can go a long way toward offsetting this shortcoming. Don't be surprised, however, to see the program fooled occasionally, and a lonely pile of orphaned line segments lying forgotten in a corner of the screen. After all, *Fantavision* only does most of the work; the animator still needs to guide the overall look of the animation.

Apart from not being able to produce really complex, finely detailed images, there are virtually no bounds to this program. It's smooth, fast, intuitive, and even young children could probably pick it up without too much trouble. For the more advanced user, the realm of animation is opened up with an ease and fluidity that really can seem magical.

Fantavision
Apple II, II+, IIe, IIc (64K RAM
required)
Brøderbund Software, Inc.
17 Paul Drive
San Rafael, CA 94903
\$49.95

aa

Windows

Lee Swoboda

An Apple II computer is not a Macintosh, yet we're seeing more and more Mac-like software for the Apple II, II+, IIe, and IIfx. Duplicating Macintosh-style windows—just one of the useful features of that machine's operating system—is simple with this program. For all Apple II-series computers, using either DOS 3.3 or ProDOS.

One of the features that makes the Macintosh so easy to use is its ability to open and close multiple windows on the screen. These windows—basically smaller text screens superimposed on the main screen—can provide additional information, offer menu selections, or provide a notepad-style environment where you can enter and save text. Once the information has appeared or the menu item has been chosen, the window can be erased, letting you get on with the task at hand.

The Apple II-series computers can create windows, too, even automatically save and restore text screens. With "Windows" at your disposal, you can open a window in an existing text screen and make it disappear, all without having to reprint the underlying screen. Windows easily simulates a Macintosh appearance in your own BASIC programs, letting you operate with as many as nine windows (ten if you count the main screen).

Machine Language 'The Easy Way

Though Windows is a machine language program, you don't need to know anything about machine language programming to enter or use it. Program 1, "Windows Creator" is a BASIC program that you can type in, save, and run. Once it's run, it creates a machine language file on the disk. (Because Program 1 uses the name WINDOWS for the machine language file it writes to disk, you cannot use that name for Program 1 itself. If you save Program 1 with the name WINDOWS, you'll get a FILE TYPE MISMATCH error when you run Program 1.) To load Windows (the machine language program Program 1 created), enter:

BLOAD WINDOWS

Windows is now in memory, waiting. Simple.

But Windows does nothing all by itself. It must be used in conjunction with a BASIC program. Let's take a look at a demonstration of what Windows can do.

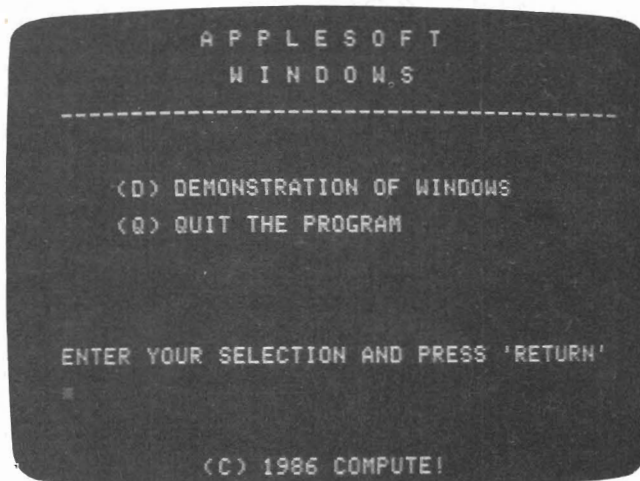
Showing Off

Type in and save Program 2, "Windows In BASIC." (Remember, you must use some name other than WINDOWS for this program.) This is a complete illustration of Windows' power, and works in either DOS 3.3 or ProDOS. If you're using the latter, however, you must make one change. Modify line 110 so that it reads:

110 HIMEM: 33792

Make sure a copy of the WINDOWS file created by Program 1 is on the same disk as Program 2, then type RUN. You'll see this:

Figure 1: The Main Screen



Press the D key, then hit Return to run the demonstration. The computer will display window 1, as you can see in Figure 2.

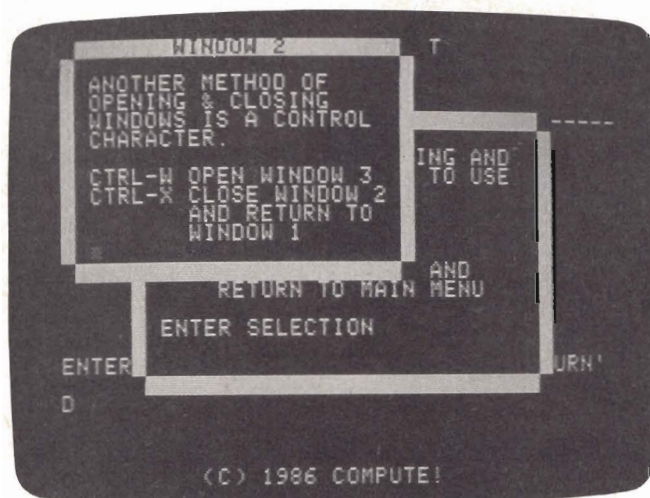
Window 1 is superimposed over the main screen, so parts of the latter still show around the solid white border of the window. The computer has saved the main screen to be restored later.

Press W to open window 2. This second window is also superimposed on the previous screen, so parts of both the main screen and window 1 show around its edges.

Figure 2: First Window Added



Figure 3: Another Window



Type *Ctrl-W* (Hold the Ctrl key and press W). The computer places the third window over the ones already on the screen.

Figure 4: Window Three



Type your name (or anything else) in the blank on window 3 and press Return. The computer remembers what you typed, but closes window 3 and returns to window 2. Press Ctrl-X to close window 2, then hit the X key to close window 1. You're back where you started, with the main screen displayed.

In this demonstration, windows 1 and 2 were menus, but if a program allows you to type something on a window, it will be restored when you close the window.

Each time you opened a window, the computer saved the current screen to memory. Each time you closed a window, the computer restored the screen it had saved.

Now press Q and hit Return. The computer exits the program, printing the text you typed in window 3 on the screen as it says goodbye.

Inside Windows

The Apple's 40-column text screen is located at memory addresses 1024-2047. When you open a window, the machine language program Windows copies the data on the current text screen to a safe place above HIMEM, and transfers it back when you close a window. Windows also stores information about the screen size and cursor location so that the computer remembers the exact screen arrangement when you close the window.

In Apple II-series computers, memory addresses 32-37 maintain information about the text screen:

Address	Contents
32	Left margin (default = 0)
33	Width (default = 40)
34	Top margin (default = 0)
35	Bottom margin (default = 24)
36	Horizontal cursor location
37	Vertical cursor location

Program 2 POKES values to these addresses to change the text screen characteristics. Take a close look at the listing. Though it's only a simple example, it shows how you can use Windows in your own programs.

Windows Of Your Own

Lines 100-130 in Program 2 are mandatory to initialize the program parameters. You must include these same lines (slightly modified) in your own program in order to use Windows.

Line 110. The value of HIMEM in line 110 depends on the maximum number of windows you intend to use, and whether you're using DOS 3.3 or ProDOS. See Table 1 for the appropriate values.

Table 1: HIMEM Values

Maximum # of Windows	DOS 3.3	ProDOS
1	36352	35840
2	35328	34816
3	34304	33792
4	33280	32768
5	32256	31744
6	31232	30720
7	30208	29696
8	29184	28672
9	28160	27648
10	27136	26624

Line 120. These POKes should be specified early in the program. (Table 2 shows the values which must be POKed into memory to open and close windows—you'll find the locations in line 120 listed in this table.) Of these three POKes, the only one which you'll need to change in your own program is POKE 769,WMAX. Simply set WMAX to the maximum number of windows your program will allow.

Line 130. These POKes establish the default characteristics of the Apple II text screen. Take a look at the listing above (locations 32-37), and you'll see that the four POKes in this line set up the default values of:

Left margin	0
Width	40
Top margin	0
Bottom margin	24

Enter these POKes in your own program just as you see them in line 130 of Program 2.

Opening Windows

Lines 300 and 310 in Program 2 are an example of the information you *must* provide to open a window. The POKes in line 300 define the size and location of the window, while the POKE and CALL in line 310 activates Windows. Each window is defined by POKEing the window characteristics before CALLing Windows with CALL 37376. For example, line 300 defines window 1 as having a left margin in column 5 (POKE 32,5), a width of 30 characters (POKE 33,30), a top margin at text line 4 (POKE 34,4) and a bottom margin at text line 19 (POKE 35,19).

Closing Windows

Line 430 is an example of closing a window. You need only to POKE 768,0 and CALL 37376—you don't need to redefine the window parameters. When Windows opens a window, it stores the window parameters, then automatically restores them when it closes the window.

Windows stores the parameters for each window in the normally unused space beginning at memory location 768 (\$0300 in hexadecimal). Table 2 lists the values stored at each address.

Each text screen is saved in a separate area above HIMEM, beginning with Window 0 (the main screen), stored from memory addresses 36352 to 37376, and working downward.

When you close a window, the computer

Table 2: Windows Variable Storage

Memory Address	Description	Monitor Address	Range
768	Direction of window movement	n/a	0=Open, 1=Close
769	Maximum number of windows	n/a	1-n
770	Current window number	n/a	0-10
771	Window 1, left margin	32	0-39
772	Window 1, width	33	1-40
773	Window 1, top margin	34	0-22
774	Window 1, bottom margin	35	1-24
775	Window 0, horizontal cursor position	36	0-39
776	Window 0, vertical cursor position	37	0-23
777	Window 2, left margin	32	0-39
778	Window 2, width	33	1-40
779	Window 2, top margin	34	0-22
780	Window 2, bottom margin	35	1-24
781	Window 1, horizontal cursor position	36	0-39
782	Window 1, vertical cursor position	37	0-23
783	Window 3, left margin	32	0-39
784	And so on		

restores the original screen by POKEing the screen characteristics in locations 32-37 and moving the text screen from storage back to the text screen buffer at memory addresses 1024-2047. Note, too, that with each window's margin and width values are stored the *previous* window's cursor positions. Thus, when you close a window, the cursor appears at the position it occupied *before* that window was opened.

Using Windows on your Apple II won't turn it into a Macintosh, but it can add some of the sophistication of the Macintosh to your BASIC programs. Open a window and see for yourself.

Program 1: Windows Creator

Be sure to use "Apple Automatic Proofreader," found elsewhere in this issue, to enter the following programs.

```

01 10 REM BASIC PROGRAM FOR
02 20 REM GENERATING THE
03 30 REM BINARY FILE
04 40 REM 'WINDOWS'
05 50 HOME
06 60 VTAB 12: PRINT "WORKING ..."
07 70 FOR I = 0 TO 841
08 80 READ A
09 90 POKE 37376 + I,A
10 100 VTAB 12: HTAB 13: PRINT I + 1
11 110 NEXT I
12 120 PRINT CHR$(4)"BSAVE WINDOWS, A373
    76, L1012"
13 130 PRINT : PRINT "DONE!"
14 140 DATA 173,89,170,72,165,217,72
15 150 DATA 165,118,72,169,2,133,118
16 160 DATA 169,255,133,217,169,191,133
17 170 DATA 51,169,0,133,243,76,35
18 180 DATA 146,0,0,0,146,0,8
19 190 DATA 169,29,133,133,169,146,160
20 200 DATA 0,162,5,32,47,149,173
21 210 DATA 0,3,141,29,146,169,0
22 220 DATA 141,30,146,173,29,146,201
23 230 DATA 1,208,10,173,30,146,201
24 240 DATA 0,208,3,76,67,147,173
25 250 DATA 2,3,141,29,146,169,0
26 260 DATA 141,30,146,173,1,3,141
27 270 DATA 31,146,169,0,141,32,146
28 280 DATA 238,29,146,208,3,238,30
29 290 DATA 146,173,30,146,205,32,146
30 300 DATA 48,15,208,10,173,29,146
31 310 DATA 205,31,146,144,5,240,3
32 320 DATA 76,237,148,32,125,148,169
33 330 DATA 32,141,33,146,169,0,141
34 340 DATA 34,146,173,34,146,201,0
35 350 DATA 48,14,208,9,173,33,146
36 360 DATA 201,37,144,5,240,3,76
37 370 DATA 223,146,173,33,146,141,176
38 380 DATA 146,173,34,146,141,177,146
39 390 DATA 173,37,0,141,29,146,169
40 400 DATA 0,141,30,146,173,31,146
41 410 DATA 141,202,146,173,32,146,141
42 420 DATA 203,146,173,29,146,141,14
43 430 DATA 3,238,31,146,208,3,238
44 440 DATA 32,146,238,33,146,208,3
45 450 DATA 238,34,146,76,142,146,32
46 460 DATA 187,148,169,0,141,33,146
47 470 DATA 169,4,141,34,146,173,34

```

```

48 480 DATA 146,201,7,48,14,208,9
49 490 DATA 173,33,146,201,255,144,5
50 500 DATA 240,3,76,61,147,173,33
51 510 DATA 146,141,14,147,173,34,146
52 520 DATA 141,15,147,173,255,7,141
53 530 DATA 29,146,169,0,141,30,146
54 540 DATA 173,31,146,141,40,147,173
55 550 DATA 32,146,141,41,147,173,29
56 560 DATA 146,141,255,141,238,31,146
57 570 DATA 208,3,238,32,146,238,33
58 580 DATA 146,208,3,238,34,146,76
59 590 DATA 236,146,32,88,252,76,237
60 600 DATA 148,173,2,3,141,29,146
61 610 DATA 169,0,141,30,146,173,29
62 620 DATA 146,208,3,206,30,146,206
63 630 DATA 29,146,173,30,146,201,0
64 640 DATA 48,9,208,10,173,29,146
65 650 DATA 201,0,176,3,76,237,148
66 660 DATA 32,125,148,169,32,141,33
67 670 DATA 146,169,0,141,34,146,173
68 680 DATA 34,146,201,0,48,14,208
69 690 DATA 9,173,33,146,201,37,144
70 700 DATA 5,240,3,76,202,147,173
71 710 DATA 31,146,141,155,147,173,32
72 720 DATA 146,141,156,147,173,2,3
73 730 DATA 141,29,146,169,0,141,30
74 740 DATA 146,173,33,146,141,181,147
75 750 DATA 173,34,146,141,182,147,173
76 760 DATA 29,146,141,37,0,238,31
77 770 DATA 146,208,3,238,32,146,238
78 780 DATA 33,146,208,3,238,34,146
79 790 DATA 76,121,147,32,187,148,56
80 800 DATA 173,31,146,233,0,141,31
81 810 DATA 146,173,32,146,233,4,141
82 820 DATA 32,146,169,0,141,33,146
83 830 DATA 169,4,141,34,146,173,34
84 840 DATA 146,201,7,48,14,208,9
85 850 DATA 173,33,146,201,255,144,5
86 860 DATA 240,3,76,57,148,173,31
87 870 DATA 146,141,10,148,173,32,146
88 880 DATA 141,11,148,173,255,145,141
89 890 DATA 29,146,169,0,141,30,146
90 900 DATA 173,33,146,141,36,148,173
91 910 DATA 34,146,141,37,148,173,29
92 920 DATA 146,141,255,7,238,31,146
93 930 DATA 208,3,238,32,146,238,33
94 940 DATA 146,208,3,238,34,146,76
95 950 DATA 232,147,173,2,3,141,29
96 960 DATA 146,169,0,141,30,146,173
97 970 DATA 29,146,201,0,208,26,173
98 980 DATA 30,146,201,0,208,19,169
99 990 DATA 0,133,32,169,40,133,33
100 1000 DATA 169,0,133,34,169,24,133
101 1010 DATA 35,76,237,148,169,0,133
102 1020 DATA 138,169,6,174,30,146,172
103 1030 DATA 29,146,32,1,149,142,30
104 1040 DATA 146,140,29,146,76,237,148
105 1050 DATA 173,29,146,141,2,3,56
106 1060 DATA 173,29,146,233,1,141,31
107 1070 DATA 146,173,30,146,233,0,141
108 1080 DATA 32,146,169,0,133,138,169
109 1090 DATA 6,174,32,146,172,31,146
110 1100 DATA 32,1,149,142,32,146,140
111 1110 DATA 31,146,24,169,3,109,31
112 1120 DATA 146,141,31,146,169,3,109
113 1130 DATA 32,146,141,32,146,96,173
114 1140 DATA 2,3,141,31,146,169,0
115 1150 DATA 141,32,146,169,4,133,138
116 1160 DATA 149,0,174,32,146,172,31
117 1170 DATA 146,32,1,149,142,32,146
118 1180 DATA 140,31,146,56,169,0,237
119 1190 DATA 31,146,141,31,146,169,146

```



```

1A 1200 DATA 237,32,146,141,32,146,96
09 1210 DATA 104,133,118,104,133,217,104
ED 1220 DATA 141,89,170,169,141,141,1
39 1230 DATA 2,169,1,133,52,96,133
27 1240 DATA 137,132,135,134,136,169,0
18 1250 DATA 133,133,133,134,70,136,102
A1 1260 DATA 135,144,13,24,165,137,101
7C 1270 DATA 133,133,133,165,138,101,134
79 1280 DATA 133,134,6,137,38,138,165
9D 1290 DATA 136,5,135,208,227,164,133
9F 1300 DATA 166,134,96,133,134,132,135
1B 1310 DATA 160,0,169,0,145,133,200
ED 1320 DATA 208,2,230,134,138,208,4
1E 1330 DATA 198,135,48,4,202,76,53
E5 1340 DATA 149,96

```

Program 2: Windows In BASIC

```

72 100 WMAX = 3
DF 110 HIMEM: 34304: REM SEE TABLE 1
38 120 POKE 768,0: POKE 769,WMAX: POKE 77
0,0
6F 130 POKE 32,0: POKE 33,40: POKE 34,0:
POKE 35,24
5A 140 D$ = CHR$ (4)
3E 150 PRINT D$"BLOAD WINDOWS"
50 160 HOME
F9 170 PRINT TAB( 11)"A P P L E S O F T"
F0 180 PRINT
F3 190 PRINT TAB( 13)"W I N D O W S"
CD 200 PRINT : PRINT "-----"
-----: REM 40 DAS
HES
69 210 VTAB 24: PRINT TAB( 11)"(C) 1986 C
OMPUTE!";
15 220 VTAB 9: HTAB 5: PRINT "(D) DEMONST
RATION OF WINDOWS"
6E 230 PRINT : PRINT TAB( 5)"(Q) QUIT THE
PROGRAM"
D4 240 VTAB 18: PRINT "ENTER YOUR SELECTI
ON AND PRESS 'RETURN'"
86 250 VTAB 20: HTAB 1: CALL - 868: INPUT
"";A$
20 260 IF A$ = "D" THEN 300
46 270 IF A$ = "Q" THEN 780
21 280 GOTO 250
E1 290 REM WINDOW 1
3A 300 POKE 32,5: POKE 33,30: POKE 34,4:
POKE 35,19
82 310 POKE 768,0: CALL 37376
51 320 GOSUB 860
AE 330 INVERSE : VTAB 5: HTAB 11: PRINT "
WINDOW 1": NORMAL
1E 340 VTAB 7: HTAB 3: PRINT "ONE METHOD
OF OPENING AND"
5A 350 HTAB 3: PRINT "CLOSING WINDOWS IS
TO USE"
C3 360 HTAB 3: PRINT "A MENU."
28 370 VTAB 12: HTAB 3: PRINT "(W) OPEN W
INDOW 2"
BD 380 HTAB 3: PRINT "(X) CLOSE WINDOW 1
AND"
8D 390 HTAB 7: PRINT "RETURN TO MAIN MENU
"
BD 400 VTAB 16: HTAB 3: PRINT "ENTER SELE
CTION"
8D 410 VTAB 16: HTAB 19: GET A$
C6 420 IF A$ = "W" THEN 460
88 430 IF A$ = "X" THEN POKE 768,1: CALL
37376: GOTO 250
18 440 GOTO 410
EB 450 REM WINDOW 2

```

```

F7 460 POKE 32,0: POKE 33,25: POKE 34,0:
POKE 35,13
8F 470 POKE 768,0: CALL 37376
5E 480 GOSUB 860
26 490 VTAB 1: HTAB 9: INVERSE : PRINT "W
INDOW 2": NORMAL
8A 500 VTAB 3: HTAB 3: PRINT "ANOTHER MET
HOD OF"
30 510 HTAB 3: PRINT "OPENING & CLOSING"
37 520 HTAB 3: PRINT "WINDOWS IS A CONTRO
L"
89 530 HTAB 3: PRINT "CHARACTER."
1D 540 VTAB 8: HTAB 3: PRINT "CTRL-W OPEN
WINDOW 3"
E8 550 HTAB 3: PRINT "CTRL-X CLOSE WINDOW
2"
E3 560 HTAB 10: PRINT "AND RETURN TO"
BC 570 HTAB 10: PRINT "WINDOW 1"
5F 580 VTAB 12: HTAB 3: GET A$
51 590 IF A$ = CHR$ (23) THEN 630
18 600 IF A$ = CHR$ (24) THEN POKE 768,1:
CALL 37376: GOTO 410
9B 610 GOTO 580
F7 620 REM WINDOW 3
62 630 POKE 32,15: POKE 33,25: POKE 34,9:
POKE 35,21
8B 640 POKE 768,0: CALL 37376
5A 650 GOSUB 860
58 660 VTAB 10: HTAB 9: INVERSE : PRINT "
WINDOW 3": NORMAL
D2 670 VTAB 12: HTAB 3: PRINT "THIS IS TH
E LAST WIN-"
E6 680 HTAB 3: PRINT "DOW. TYPE SOMETHING
"
EC 690 HTAB 3: PRINT "BELOW, THEN PRESS"
8F 700 HTAB 3: PRINT "'RETURN' TO CLOSE"
EF 710 HTAB 3: PRINT "WINDOW 3 AND RETURN
"
6D 720 HTAB 3: PRINT "TO WINDOW 2."
F3 730 VTAB 19: HTAB 3: PRINT ".....
....."
EE 740 VTAB 19: HTAB 3: INPUT "";B$
86 750 POKE 768,1: CALL 37376
A6 760 GOTO 580
69 770 REM QUIT
5A 780 HOME
CD 790 IF B$ = "" THEN B$ = "NOTHING"
DA 800 VTAB 10: PRINT "YOU ENTERED"
4E 810 VTAB 12: PRINT CHR$ (34)B$ CHR$ (3
4)
21 820 VTAB 14: PRINT "ON WINDOW 3"
A7 830 VTAB 20: PRINT "GOODBYE" CHR$ (7)
CHR$ (7)
9B 840 END
36 850 REM BORDER
8B 860 BL$ = "
": REM 40 SPACES
7D 870 I = PEEK (770)
13 880 IF I = 0 THEN RETURN
73 890 I = 771 + 6 * (I - 1)
7F 900 WL = PEEK (I):WW = PEEK (I + 1):WT
= PEEK (I + 2):WB = PEEK (I + 3)
30 910 INVERSE
BE 920 HTAB 12: PRINT LEFT$ (BL$,WW - 2);
63 930 VTAB WB: HTAB 2: PRINT LEFT$ (BL$,
WW - 2);
3A 940 FOR I = WT + 2 TO WB - 1
A7 950 VTAB I: HTAB 1: PRINT " "
20 960 VTAB I: HTAB WW: PRINT " ";
F3 970 NEXT I
DC 980 NORMAL
2B 990 RETURN

```

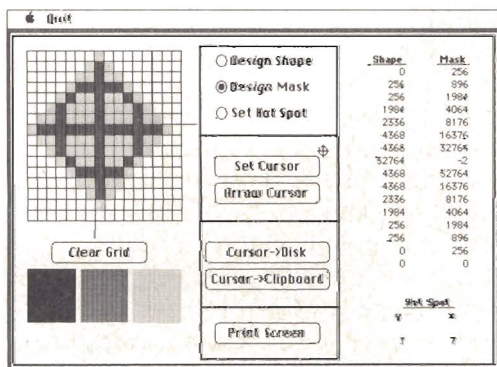

MouseCursor

Sharon Zardetto Aker

Tired of the mouse arrow pointer staring back at you from the Mac screen? It's easy to change with "MouseCursor"—a simple utility written in Microsoft BASIC for the Macintosh—and this tutorial.

Where would the Mac be without its mouse? And where would the mouse be without its cursor? Microsoft BASIC on the Macintosh is special for a lot of reasons—one of which is the control it gives you over the appearance (and disappearance and reappearance) of the mouse cursor. Learn how to exercise that control with this tutorial—and use the accompanying "MouseCursor" program to make cursor design a breeze.

Figure 1: The MouseCursor Screen



MouseCursor lets you design a cursor on a large grid and test it against sample backgrounds. Once you've created a cursor, you can save the data to a disk file or to the Clipboard.

Microsoft BASIC lets you access many of the Macintosh's built-in routines—the routines stored in the Read Only Memory (ROM) of the machine. Using a routine is referred to as *calling a ROM routine*. The syntax of a ROM call statement usually includes the keyword **CALL**, though none of the cursor calls need that keyword.

Some ROM calls are so simple you can jump right in. This short program, for instance:

OBSCURECURSOR

loop: **GOTO** loop

makes the cursor disappear. As soon as you move the mouse even a tiny bit, the cursor becomes visible again. **OBSCURECURSOR** makes the cursor invisible until the mouse is moved.

Or, try:

HIDECURSOR

FOR n=1 **TO** 5000

SHOWCURSOR

The cursor disappears as soon as you run the program, and stays invisible until the **SHOWCURSOR** routine is called—no matter what you do to the mouse. While **OBSCURECURSOR** hides the cursor until the mouse is moved, **HIDECURSOR** keeps it invisible until **SHOWCURSOR** is called.

Cursor Design

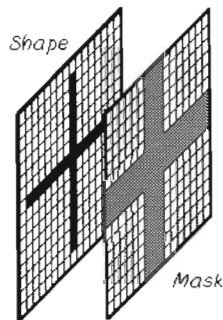
The **SETCURSOR** command instructs the Macintosh to change the shape of the cursor to the one you've defined. You define a cursor by using numbers describing its three components:

the *shape*, the *mask*, and the *hot spot*.

The *shape* of a cursor is its obvious appearance—an arrow, an I-beam, a paint bucket, or anything else you can design within a 16 × 16 pixel grid.

The *mask* is a kind of overlay on the shape which controls how the shape will be seen as it passes over black, white, or patterned areas of the Macintosh screen. Sometimes a cursor will invert as it passes over a dark area; most of the time there is a white halo effect around its edges. These things are controlled by the mask.

Figure 2: Shape And Mask



The cursor's mask acts as an overlay on the shape—together, they determine how the cursor appears against various backgrounds.

The *hot spot* is the one spot on the cursor that really counts—the tip of the pencil in MacPaint, or the point of the arrow. When you click the mouse button, it's the cursor hot spot which determines the coordinates of the cursor's position.

All together, you need 34 numbers to describe the cursor—16 each for the shape and mask, and 2 for the hot spot. The numbers are stored in an integer array to which you "point" with the VARPTR function when the SET-CURSOR call is made. For instance, if your numbers are stored in an array named C% (the percent sign signifies that it's an integer array), beginning at element 1, the cursor call would look like this:

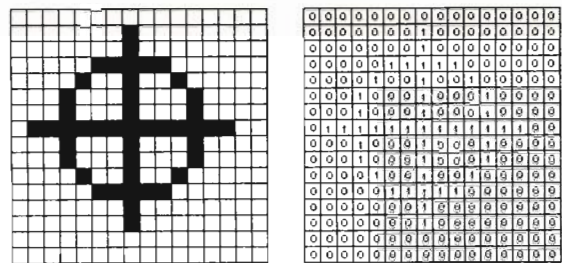
```
SETCURSOR(VARPTR(C%(1)))
```

That's the easy part. Figuring out the numbers takes more work.

The Shape

First, design your cursor shape. Make a 16 × 16 grid, and shade the squares (FatBits-style) to make the shape you want. Every row of the grid represents a 16-digit binary number. Binary numbers are composed of 1s and 0s—in your grid, black squares are 1s and empty squares are 0s.

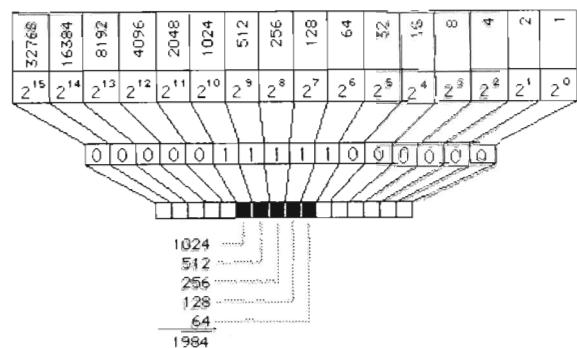
Figure 3: Ones And Zeros



The black and white squares of your design have to be changed to 1s and 0s.

Each digit in a binary number represents a power of two, just as every digit in our decimal system represents a power of ten.

Figure 4: Powers Of Two



Each row of the grid stands for a 16-bit binary number. You can translate the grid row into a decimal number by adding together the values of each of the 1s in the binary number.

To figure the decimal value of the binary number taken from your grid, you have to add together all the numbers that the 1s represent, as shown in Figure 4. Once you calculate the number for each row, you have the first 16 numbers you need for your cursor, and you can store them in an array. But there's a catch—you must use an integer array whenever the VARPTR function is going to be used, and BASIC can't handle integers greater than 32767. You find relief from this Catch-22 by using hex or octal numbers, but you're already working in both base 10 and base 2, so why worry about another number system? Instead, start thinking like the Macintosh—any integer greater than 32767 is represented in a special format called *two's complement*, a binary number trick that results in a decimal equivalent of a negative number. Subtract 65536 from any number greater than 32767 and the result is an integer within the allowed boundaries—it just has a negative sign in front of it.

Thus, for the number 34896, you'd use:

$$[34896 - 65536] = -30640$$

You can enter that into the array of cursor

information, and by the time it's passed to the ROM routine, you've fooled the Macintosh into handling the large number.

The Mask

The mask you design for the cursor is extremely important, since it controls how the cursor looks against various backgrounds. It, too, is designed on a 16×16 grid, with each grid square representing a bit (digit) in a binary number.

The combination of shape and mask in any given square of the grid controls how that pixel of the cursor appears against any background. There are four possible combinations of the shape and mask bits, corresponding to the four possibilities for any pixel in the cursor. Parts of the cursor can be:

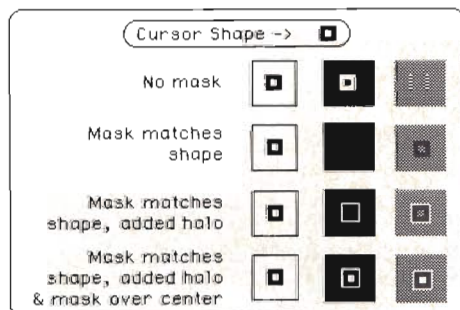
- Always black
- Always white
- Always the opposite of the background
- Always the same as the background (in which case it is *transparent*).

The Bit Combination Table shows the possible combinations and their results. You can think of the mask as a protection device for the shape you designed. When the mask bit is 1, the corresponding bit in the shape is protected from change, so black stays black, and white stays white. When the mask is *off*, or set at 0, there's no protection for the shape bits, so black always inverts and white always disappears.

Bit Combination Table

When Shape Bit Is	And Mask Bit Is	Then Cursor Pixel Is
1 (black)	1 (on)	Black
0 (white)	1 (on)	White
1 (black)	0 (off)	Inverse of background
0 (white)	0 (off)	Same as background (transparent)

Figure 5: Who Was That Mask?



Using different masks over the same cursor shape gives different effects against white, black, and patterned backgrounds.

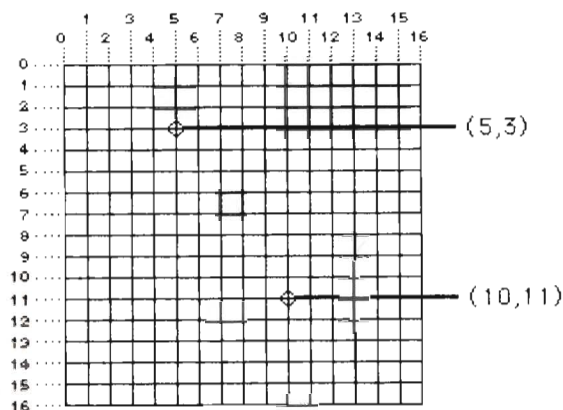
Once you decide on your mask, translate it into numbers the same way as the shape was translated. These figures provide 16 more numbers for the cursor array, and are stored in the second 16 elements of the array. Although different masks can give different results with a cursor shape, the most common mask covers all the black parts and the interior white spaces of the shape, and adds a halo around the shape to make it stand out against a dark background.

The Hot Spot

The **hot spot** is so small that it isn't even a pixel in your grid. Instead, it is a spot outside the corner of a pixel. Look at your cursor grid and pay attention to the lines which form it, rather than the spaces. Label each vertical line from 0 to 16 starting at the left and label each horizontal line from 0 to 16 starting at the top.

Find the **place** you want your hot spot to be, and **note its** coordinates. These numbers are the last two you need for your 34-element cursor array.

Figure 6: The Hot Spot

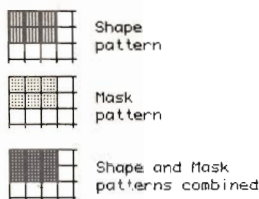


The hot spot is not a pixel, but a corner outside the pixel. Its coordinates are based on its position in the grid.

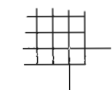
Using MouseCursor

MouseCursor lets you design all the components of a cursor simply by clicking in the squares of a grid to turn them on or off. Use the buttons in the center of the screen (shown in Figure 1) to indicate whether you're designing the shape, the mask, or picking the hot spot. You can move from one mode to another at any time.

When you click in a square of the grid it fills in so you can see your pattern. While designing your shape, the fill pattern will be striped—for the mask, the fill is light gray. When both the shape and the mask are *on* in a



even in a square they both occupy, so you can turn one off and leave the other on.



When you're indicating the hot spot, click in a square. The hot spot will be positioned at the upper-left corner of the square's frame. The pixel at the hot spot position turns white. Since this is sometimes difficult to see, two guidelines appear to the right and below the grid which point to the hot spot.

When you think your pattern is ready, click the *Set Cursor* button. The shape, mask, and hot spot will be calculated, and the data will be listed on the screen. The cursor will change to the one you designed—try it against the black and grey sample backgrounds to see if the mask has the effect you want.

If you want to change anything, just click in the design button you want. It will probably be easier to continue your work with the standard arrow cursor, so click in the *Arrow Cursor* button to get it back.

When you've created a cursor you like, you have two save options—You can save the data in a file on the disk, or put the information on the Clipboard for immediate pasting into your own program—or, you can do both.

If you click the *Cursor->Disk* button, an edit field will appear below the sample pattern boxes so you can name the cursor. When you press Return, the data is saved in the file you named. (There's no choice about the disk this is saved to—it goes onto the default disk BASIC is running from. You can always drag it over to another disk later.)

When you want to use the information in the cursor file in one of your own programs, just type:

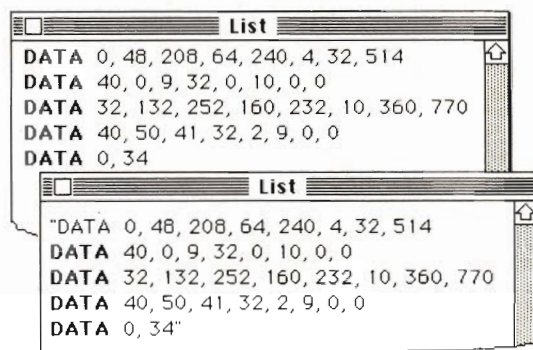
```
merge"filename"
```

(where *filename* is the name of the cursor file) in the Command window and the cursor data will be appended to the end of your current program. The data is already in the form of DATA statements. All you have to do is read this data into an array that you can use with the SETCURSOR call.

When you choose to transfer the data to your program via the Clipboard option, you'll find that the pasted information has quotes at the beginning and end of the DATA statement block:

given square, the patterns combine to form a dark checkered pattern. You can erase a square by clicking in it again. The shape and mask patterns are independent of one another,

Figure 7: Clipboard DATA



When a saved cursor file is merged into a BASIC program, it appears as DATA statements. If the data is pasted from the Clipboard, the block of data is enclosed in quotes.

The reason for this is covered in the "Program Notes" section of this article—just erase the quote marks and go ahead and use the DATA statements.

Once you've added the DATA statements to your program, you need to read the numbers from the DATA lines into an integer array and use the SETCURSOR command to redefine the cursor with the new shape data. The following sample program lines illustrate how this is done:

```
DIM c%(34)
FOR n=1 TO 34:READ c%(n):NEXT n
SETCURSOR(VARPTR(c%(1)))
```

If you want to design another cursor in the same session, you can use the *Clear Grid* button to start from scratch, or just alter the cursor already in the grid. The grid is always active, and works in the mode that's selected.

A couple of notes about using MouseCursor. First of all, don't access any of the desk accessories while designing a cursor. If you do, the grid on the left will be erased when any overlaying desk accessory window is closed. Secondly, to quit MouseCursor, select *Quit* from the menu of the same name. A List window appears to one side and the standard BASIC menu bar returns at the top. To open another program at this point (to paste cursor data from the Clipboard, for instance), simply open any other BASIC file, then select *Paste* from the *Edit* menu when the insertion point is in the appropriate position.

Program Notes

You don't really need to know how the program works in order to use it—there's not enough space here to describe the listing in detail. However, these general notes are meant to guide the intermediate-level programmer through the main components of the program.

General Comments

- The patterns used for the shape and mask fills had to fit together perfectly, so erasing one would not affect the other. At the same time, it was important to know just where in each box the pixels would be darkened for either pattern so the correct part of the screen could be read when the cursor was finished.
- The XOR pen mode is used so that a pattern put down on top of itself erases itself. You don't have to keep track of whether the box was filled previously.
- There were many ways in which the final data could have been stored to a disk file, but sending it to the Clipboard posed a problem. Commas on the Clipboard are interpreted as tabs, and so are lost. The somewhat inelegant solution is to turn the values into characters and concatenate them, inserting a comma character between each number and adding a Return character at the end of each DATA statement. Printing this to the Clipboard file still leaves the commas open to conversion, so the WRITE# statement was used—it places quotation marks around any string. Of course, you are left with quotes to delete when the string is pasted back into a listing, but that's easy enough.

The Listing

The first section of the listing—the first 45 or so lines—sets up the screen and the event traps. The only result of the menu event trap is the stopping of the program, since there's only one menu choice. The dialog event trap handles buttons only. Although there's a portion of the program which uses an edit field, the dialog trap is turned off during its execution.

The three sample patterns are also set up in the beginning of the program—the data for the patterns is available in the array *pat%*, starting at different elements for the different patterns.

The *stage.manager* routine keeps track of which mode the user is in: shape, mask, or hot spot. The pen pattern is set to the correct pattern for filling the grid squares based on which mode the program is in.

The *checkmouse* routine checks for the mouse button being clicked. Note that it looks for the release of the button as well as its being pressed. If the hot spot is being defined, the program jumps to the *pick.spot* label, otherwise it continues with *fill.boxes*.

Both *pick.spot* and *fill.boxes* begin by confirming that the click was within the grid area, and then calculate the upper-left corner of the box that the click was made in. *Fill.box* fills (or erases) the square. In *pick.spot*, PENNORMAL is

called so the guidelines will not be drawn in the current pattern, but in black. The *spotter* subroutine marks the hot spot in the grid and puts the guidelines outside the grid. The *thru* flag is set if the hot spot has already been drawn—if so, the *spotter* subroutine is invoked to erase the previous hot spot and guidelines before the new ones are calculated. *Pick.spot* and *fill.box* both loop directly back to *check.mouse*; this loop is only exited when the user clicks in a screen button.

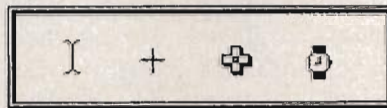
The Button Events

There are nine buttons on the screen, so the ON-GOSUB must list nine subroutines. However, buttons 1, 2, and 3 need the same handling, so the *setstg* (set stage) routine is listed three times here.

Setstg deactivates the previously selected radio button: Shape, Mask, or Hot Spot, and changes the value of *stage* to match the new selection. When the program returns to *stage.manager*, the newly selected button is activated.

Read.it, called when the *Set Cursor* button is pressed, scans the screen in the area of the grid, reading a specific pixel in each square. The first sweep checks for the shape pattern in the square, the second sweep for the mask pattern. For each row in the grid, where a pattern is on in the square, the bit value is calculated. The

System Cursors: Easy Does It



Besides the arrow, the Macintosh has four

additional cursors built into its system: an I-beam text cursor, a crosshairs, a cross, and a wristwatch. The CLR machine language libraries (Clear Lake Research, 5353 Dora Street #7, Houston, TX, 77005) give you easy access to these cursors. When you use the libraries, they add over 100 new keywords to BASIC. One of these commands is *ChangeCursor*, and all you have to do is use it with a number that identifies the system cursor you want.

ChangeCursor 4

will, for instance, put the wristwatch on the screen. The *MouseCursor* program hides the cursor while data calculations are being made, but switching to the wristwatch would be much more in keeping with the Macintosh user interface.

Typing The Listing

Microsoft BASIC on the Macintosh keeps each program line on one physical line, regardless of its length. Unfortunately, such an arrangement is impractical in a printed listing. There were some program lines which could not be shortened for easier printing. Double bullets (••) indicate where a single program line has been broken into multiple lines for the listing. Type them as a single line in the List window. Do not type the bullets; they merely indicate where lines are broken in the printed listing.

Note the mathematical operators used in the *fill.box* and *pick.spot* routines—integer division with the backslash (\) is used, not the normal division slash (/).

variable *byte#* holds the total of all the bit values for a row. When the row is completed, the total is stored in a temporary array (*temp%*), with any necessary conversion to negative numbers. The array values are then transferred to the cursor array (*c%*), and the hot spot coordinates are added to it. All the while, the values are being printed on the screen. A quick error trap is at the end of the *read.it* routine—if the grid is blank, the cursor array is filled with numbers so the cursor will be a black square. Otherwise, when *SETCURSOR* is called, the cursor would disappear entirely.

The *init* and *copy* subroutines are brief and self-explanatory. Both the *save.it* and the *clip.it* subroutines begin with a call to *read.it* in case the user made some changes on the grid and didn't use the *Set Cursor* button. They also use the *string.it* subroutine to convert the cursor array data into a string. *Save.it* lets the user enter a filename—the WHILE-WEND loop waits for the Return key to be pressed. Both routines save the converted string data to a file: *save.it* to a disk file, and *clip.it* to the Clipboard.

The *clear.it* subroutine scrolls the current grid off the screen. It happens so quickly that the scrolling is not noticeable. It erases the data on the screen by scrolling the shape and mask data and overprinting the hot spot data. The cursor array is also emptied.

There are three subroutines used which are not directly connected to button events. *Drawgrid* uses the ROM calls *MOVETO* and *LINE* to draw the grid. *Spotter* uses *MOVETO* and *LINE* to draw the hot spot information on the grid. (Note that *LINE* (0,0) is used to draw a single spot.) *String.it* converts the cursor array data into a string—the keyword

DATA and commas are added in appropriate spots so there will be four statements with correct syntax.

MouseCursor

```
FOR m=1 TO 5:MENU m,0,1,"":NEXT m
MENU 1,0,1,"Quit":MENU 1,1,1,"Quit"
ON MENU GOSUB quit:MENU ON
ON DIALOG GOSUB button.push:DIALOG ON
WINDOW 1,,(10,30)-(503,330),2
OPTION BASE 1
DIM pat%(12),rec%(4),temp%(16),c%(34),d$(5)
FOR n=1 TO 4:pat%(n)=21930:NEXT n 'gray
FOR n=5 TO 8:pat%(n)=22016:NEXT n 'lt.gray
FOR n=9 TO 12:pat%(n)=21845:NEXT n 'stripe
DATA 215,10,265,60,215,65,265,115
DATA 215,120,265,170,5,190,300,335
```

```
screen.set.up:
TEXTSIZE(9):TEXTFACE(5)
LOCATE 2,53:PRINT" Shape "SPC(5)" Mask "
LOCATE 21,58:PRINT " Hot Spot "
TEXTFACE(1)
LOCATE 22,57:PRINT "y"SPC(7)"x"
TEXTFACE(0):GOSUB drawgrid
```

```
drawsamples:
FOR n=1 TO 4:READ d:rec%(n)=d:NEXT n
PAINTRECT(VARPTR(rec%(1)))
FOR n=1 TO 4:READ d:rec%(n)=d:NEXT n
CALL
FILLRECT(VARPTR(rec%(1)),VARPTR(pat%(1)))
FOR n=1 TO 4:READ d:rec%(n)=d:NEXT n
CALL
FILLRECT(VARPTR(rec%(1)),VARPTR(pat%(5)))
FOR n=1 TO 4:READ d:rec%(n)=d:NEXT n
CALL PENSIZE(2,2)
CALL FRAMERECT(VARPTR(rec%(1)))
CALL MOVETO(192,90):CALL LINE (140,0)
CALL MOVE(0,80):CALL LINE(-140,0)
CALL MOVE(0,80):CALL LINE(140,0)
CALL PENSIZE(1,1)
BUTTON 1,1,"Design Shape",(205,10)-(315,30),3
BUTTON 2,1,"Design Mask",(205,35)-(315,55),3
BUTTON 3,1,"Set Hot Spot",(205,60)-(315,80),3
BUTTON 4,1,"Set Cursor",(205,110)-(315,130)
BUTTON 5,1,"Arrow Cursor",(205,135)-(315,155)
BUTTON 6,1,"Cursor->Disk",(195,190)-(325,210)
BUTTON 7,1,"Cursor->Clipboard",(195,215)-(325,235)
BUTTON 8,1,"Print Screen",(205,265)-(315,285)
BUTTON 9,1,"Clear Grid",(35,190)-(135,210)
```

```
'-----Program Begins-----
stage=1
```

```
stage.manager:
BUTTON stage,2
IF stage=1 THEN pat.start=9 ELSE pat.start=5
PENPAT(VARPTR(pat%(pat.start)))
```

```
checkmouse:
PENMODE(10)
buttonup:IF MOUSE(0)<>0 GOTO buttonup
buttondown:IF MOUSE(0)=0 GOTO buttondown
a=MOUSE(1):d=MOUSE(2)
IF stage=3 GOTO pick.spot
```

```
fillboxes:
IF a<10 OR a=>170 OR d<10 OR d=>170 GOTO
••buttonup
```



```

rec%(1)=((d\10)*10)+1:rec%(2)=((a\10)*10)+1
rec%(3)=rec%(1)+9:rec%(4)=rec%(2)+9
PAINTRECT(VARPTR(rec%(1)))
GOTO checkmouse

pick.spot:
PENNORMAL:PENMODE(10)
IF a<10 OR a=>180 OR d<10 OR d=>180 GOTO
  **buttonup
IF thru THEN GOSUB spotter
thru=1
yspot=((d\10)*10):xspot=((a\10)*10)
GOSUB spotter
y=(yspot-10)/10:x=(xspot-10)/10
GOTO checkmouse

'-----Button Events-----
button.push:
q=DIALOG(0):IF q<>1 THEN RETURN
but.id=DIALOG(1)
ON but.id GOSUB setstg,setstg,setstg,read.it,init,
  **save.it,clip.it,copy,clear.it
RETURN stage.manager

setstg:
BUTTON stage,1:stage=but.id:RETURN

read.it:
HIDECURSOR
FOR n=1 TO 5:d$(n)="" :NEXT n:d$=""
FOR sweep=1 TO 2:FOR row=1 TO 16
byte#=0:bit=15
FOR col=14+sweep TO 166 STEP 10
IF POINT(col,row*10+(4+sweep))=33 THEN
  **byte#=byte#+2^bit
bit=bit-1:NEXT col
IF byte#>32767 THEN temp%(row)=CINT(byte#-
  **65536#) ELSE temp%(row)=CINT(byte#)
IF sweep=1 THEN c%(row)=temp%(row):LOCATE
  **row+2,62:PRINT USING"#####";c%(row):
  **temp%(row)=0
IF sweep=2 THEN c%(row+16)=temp%(row):LOCATE
  **row +2,73:PRINT USING"#####";c%(row+16):
  **temp%(row)=0
NEXT row:NEXT sweep
c%(33)=y:c%(34)=x
LOCATE 24,66:PRINT USING"##";y
LOCATE 24,75:PRINT USING"##";x

check:  'if shape is blank, make square black cursor
cell=1: WHILE c%(cell)=0 AND cell<17
cell=cell +1:WEND
IF cell=17 THEN FOR n=1 TO 16:c%(n)=-1:NEXT n
SETCURSOR(VARPTR(c%(1))):SHOWCURSOR:RE
  **TURN

init: INTCURSOR:RETURN

save.it:
BEEP:DIALOG OFF:TEXTSIZE(12)
EDIT FIELD 1,"Cursor Name",(10,275)-(170,290),2
WHILE PEEK(376)<>16 :WEND
cursor$=EDIT$(1):EDIT FIELD CLOSE 1
TEXTSIZE(9):DIALOG ON
GOSUB read.it:
GOSUB string.it:OPEN cursor$ FOR OUTPUT AS#1
PRINT#1,d$:CLOSE#1:RETURN

clip.it:
GOSUB read.it:GOSUB string.it
OPEN"clip:"FOR OUTPUT AS #1

```

```
WRITE #1,d$:CLOSE#1:RETURN
```

```
copy:LCOPY:RETURN
```

```

clear.it:
SCROLL (10,10)-(186,186),0,177
thru=0: GOSUB drawgrid
SCROLL(360,25)-(485,235),125,0
LOCATE 24,66:PRINT SPACES(12)
FOR n=1 TO 34:c%(n)=0:NEXT n
RETURN

```

'-----Other Subroutines-----

```

drawgrid:
PENNORMAL
CALL MOVETO(10,10):FOR n=10 TO 170 STEP 10
CALL LINETO(n,170):CALL MOVETO(n+10,10)
NEXT n
CALL MOVETO(10,10):FOR n=10 TO 170 STEP 10
CALL LINETO(170,n):CALL MOVETO(10,n+10)
NEXT n:RETURN

```

```

spotter:
CALL MOVETO (xspot,yspot):CALL LINE(0,0)
CALL MOVETO(xspot,171):CALL LINE(0,15)
CALL MOVETO(171,yspot):CALL LINE(15,0)
RETURN

```

```

string.it:
FOR m=1 TO 4:FOR n=1 TO 8
d$(m)=d$(m)+STR$(c%(n+((m-1)*8)))+","
NEXT n
d$(m)="DATA "+LEFT$(d$(m),LEN(d$(m))-
  **1)+CHR$(13)
NEXT m
d$(5)="DATA "+STR$(c%(33))+","+STR$(34)
FOR m=1 TO 5:d$=d$+d$(m):NEXT m
RETURN

```

'----Menu Event-----

```
quit: MENU RESET:LIST:STOP
```

aa

Apple Disk

All Apple II programs in this issue are available on the companion *Apple Applications Disk*. Formatted for both DOS 3.3 and ProDOS, the Disk costs \$12.95, plus \$2.00 shipping and handling, and can be purchased only through COMPUTE! Publications. See page 33 for details.

Your Personal Ledger

Alan H. Stein

This powerful, but simple-to-use financial application helps you track your expenses, income, assets, liabilities, even your taxable expenditures. You can quickly enter transactions, sort them, and print comprehensive reports. For all Apple II-series computers using either DOS 3.3 or ProDOS.

"Your Personal Ledger" is exceptionally easy to use, yet surprisingly powerful. Each financial transaction can be coded in two different ways, each with a choice of 26 different user-generated codes. Naturally, if a mistake is made, you can edit or even delete transactions. Reports can be printed with records chosen by date and/or code. It's a simple matter to get a list of all expenses for a given period of time, along with a total for those expenses.

Your Personal Ledger is completely written in Applesoft BASIC and is compatible with both ProDOS and DOS 3.3.

Starting Your Personal Ledger

Once you've entered Your Personal Ledger (make sure to use the "Apple Automatic Proof-reader" error-checking program, found elsewhere in this issue, to help you avoid typing mistakes) and saved it to disk, you're ready to begin.

The easiest way to see how to use Your Personal Ledger is to simply go through a sample tutorial session. Let's begin.

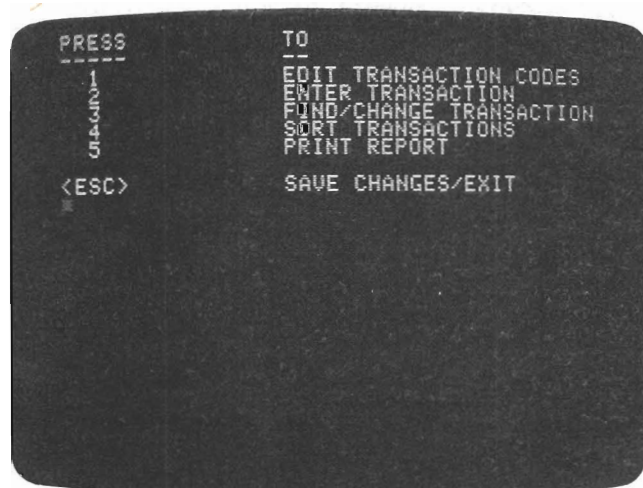
Place the disk containing Your Personal Ledger in the disk drive (drive 1 if you have a two-drive system), turn the computer on, and run the program by typing `RUN LEDGER` (or whatever other name you may have given the file). The first screen you'll see shows the following display:

```
PRESS TO
---- --
1      USE EXISTING LEDGER
2      SET UP NEW LEDGER
```

Since you've never used Your Personal Ledger before, press 2. You'll be instructed to put a formatted disk in drive 1 and press Return. (If you'd previously used Your Personal Ledger, you would have pressed 1).

The next thing you'll see is the main menu:

Figure 1: The Main Menu



The main menu of Your Personal Ledger offers six options for editing, entering, finding, sorting, printing, and saving.

Since you've not used Your Personal Ledger before, it's best to first set up some transaction codes. Press 1.

Because there are two different sets of transaction codes available, you're asked which you want to edit. Start with code 1, and you'll

see the following display:

EDIT TYPE 1 TRANSACTION CODE

CODE DESCRIPTION

A

PRESS	<--OR-->	FOR OTHER CODES
	<C>	TO CHANGE
	<ESC>	FOR MENU

Each transaction code type has 26 codes, A-Z, each of which has a description. Since you've not assigned any descriptions yet, the DESCRIPTION column is blank. Let's assign some type 1 codes. Almost everyone will find categories for *income*, *expenses*, *assets*, *liabilities*, and *other*. These descriptions can be changed at anytime, but it's a good idea to do some advance planning.

To assign the description INCOME to code A, press C (for change) and then type INCOME. Of course, press Return after entering INCOME to let your Apple know when you're done. Your Personal Ledger generally doesn't require a press of the Return key for single key responses, but it does need it when the response can be of an unknown length.

After typing in the description, you'll see it displayed where only a blank space appeared before. Now, assign the description EXPENSE to code B. That's almost as simple—just press the right arrow key and B appears beneath under CODE. You can then type in the description EXPENSE. In a similar way, assign ASSET to code C and LIABILITY to code D. But what if you want to assign OTHER to code Z? You can display code Z either by pressing the right arrow key several times, thus going through the alphabet, or by pressing the left arrow key a few times and backing up (using the left arrow key shows Z immediately after A). When you're finished, press Esc to return to the main menu.

So far, you've just set up a few type 1 codes. Now for type 2 codes (you can think of type 2 codes as subcodes of a sort). Again from the main menu, choose EDIT TRANSACTION CODES, this time picking type 2 codes. They're entered the same way as type 1 codes. To start with, enter descriptions of *salary*, *interest income*, *rent*, *food*, *utilities*, *entertainment* and, naturally, *other*.

Transactions

You're now ready to enter some transactions—press 2 from the main menu. You'll see prompts on the screen for a date, check number, codes, source/payee, description, and amount.

The date must be entered in the form mm/dd/yy. The slashes are supplied automatically and the Return key does *not* have to be pressed. However, all single-digit numbers must

be entered with leading zeros. For instance, June 5, 1986 would be entered by typing 06/05/86, and displayed as 06/05/86.

The check number can either be entered or omitted by pressing Return. You can also enter non-numerical information here—for example, a MasterCard purchase might be entered with MC in the check number column. Numbers longer than five digits are truncated, leaving only the *last* five digits. If you're entering text here, the same restriction applies.

The codes are entered in a manner similar to the way they were edited—press the arrow keys until the desired code comes into view, then press Return.

Source/Payee represents either the source of income or the person or company a payment is made to. For example, if you received a check from *COMPUTE!'s Apple Application Special*, you could type *COMPUTE*, while if you paid for your groceries by check, you'd enter the name of the market. Your Personal Ledger allows 20 characters for this entry.

Another 20 characters is allowed for the description, which might be *March groceries* or *sub to COMPUTE!*.

Finally, the amount would be entered, using only numbers and a decimal point, not the dollar sign (\$).

After entering each transaction, you're given the choice of pressing the Esc key to abort the transaction (and thus return to the menu) or pressing Return to accept the transaction. If you accept the transaction, you're taken automatically to the FIND/CHANGE menu, which can also be reached directly from the main menu (option 3). Figure 2 shows an example of what you might see after a typical transaction entry:

Figure 2: Find/Display Transaction

FIND/DISPLAY TRANSACTION

DATE:	03/12/84
CHECK NO:	1921
CODE 1:	LIABILITY
CODE 2:	SALARY
SOURCE/PAYEE:	FIRST CITIZENS BANK
DESCRIPTION:	MARCH PAYMENT
AMOUNT:	195.70

<--	-->
<C>HANGE	<J>UMP
<P>RINT	<D>ELETE
<E>ENTER	<ESC> MENU

You'll see this screen at the end of each transaction entry, as well as when you select the Find/Display option from the main menu.

You can easily view other transactions (assuming you've entered more than just one) by pressing either arrow key or by pressing the *J* key. Pressing an arrow key moves forward or backward by one transaction, while pressing *J* gives you the opportunity to move quickly through the file by specifying a number of transactions to move. Entering a positive number moves forward, while entering a negative number moves backward in the file. (If you want to move forward, you *don't* need to put a plus symbol (+) before the number of transactions to jump.)

Pressing *P* prints the transaction information, if you have a printer connected properly. Pressing *D* lets you delete the transaction. By this time, you probably haven't entered any transactions you want to delete, but keep this option in mind for later—you'll certainly find a use for it.

Pressing *C* gives you a chance to change any of the information in a transaction. You're led through each transaction and given the opportunity to either re-enter the information—in the same manner it was originally entered—or leaving it as is.

Hitting *E* lets you enter another transaction, without returning to the main menu. Press the Escape key to get back to the main menu.

Now Sorting, Now Reporting

The fourth choice from the main menu, SORT TRANSACTIONS, rearranges the transactions in chronological order. It also compresses the information in memory. Your Personal Ledger is set up for a maximum of 400 transactions. However, transactions deleted in a session count towards that maximum until the next session, *unless* the transactions are sorted. Thus, if you're unable to enter more transactions, you may be able to make room simply by sorting.

Option 5 is PRINT REPORT, the facility which enables you to get a hard copy of the data you've put in your file.

When you print a report, the first thing

you're asked is whether you want to use the default format. This format prints all fields at a predetermined width. If you decide to devise your own format, you're shown the default field widths for each field. You can accept each default by simply pressing Return, or change it by pressing *C* and entering the new width. If you want to omit a field from the report, define its width as zero. (Any custom format becomes the default format for the rest of the session.)

Let's say that you want to print a listing of all your utility bills—you won't need the second code type printed on this report. Define your own format by accepting all defaults except for the type 2 code, which you should change to a width of zero.

After determining the format, you must determine which records are to be included. The first display you'll see looks like:

SELECTION

PRESS <RETURN> TO ACCEPT ALL DATES
OR

PRESS <C> TO CHOOSE PARTICULAR DATES

If you press Return, the **date** of each transaction will not be a factor in **determining** whether to include it. If you press *C*, then you'll be asked for a time span—that is, an **earliest** date and a **latest** date. Provide the **month** and year of these dates in the form of two digits for the month and two digits for the year (0586 could be an example).

Next, you'll need to specify which codes to accept for each type (1 and 2) code. In each case, you can choose to include records with any code by simply pressing Return, or choose records which have a particular code by specifying it.

Since you want a listing of utility bills, you'll press Return for each selection criterion, except for the type 2 code, which you should specify as UTILITY.

Once the selection process is complete, Your Personal Ledger prints the report, complete with a total at the bottom, and goes back to the main menu.

Figure 3: Reporting With Your Personal Ledger

PERSONAL LEDGER REPORT

DATE	CHECK CODE 1	CODE 2	SOURCE/PAYEE	DESCRIPTION	AMOUNT
07/21/86	235 EXPENSE	FOOD	HARRY'S GROCERY	WEEKLY MARKETIN	121.73
07/22/86	236 EXPENSE	RENT	WATERSIDE CONDO	AUGUST RENT	435.00
07/23/86	237 EXPENSE	ENTERTAI	BOB'S GRILL	DINNER W/ EMILY	23.67
07/25/86	238 EXPENSE	UTILITIE	DUKE POWER	JULY ELECTRIC	69.96
TOTAL:					\$650.36

How Your Personal Ledger Works

Your Personal Ledger stores all transactions in an array called RD\$. Each element in the array corresponds to a transaction. The first six characters represent the date, stored in the form *yymmdd*. The next five characters contain the check number. The following two characters contain the type 1 and type 2 codes (a memory saving technique). Twenty characters each are set aside for the source/payee and description, with the last nine characters representing the amount of the transaction.

The actual descriptions of the codes are stored in an array CODE\$.

When the program executes, these code descriptions along with all the transaction date are read from the sequential disk file LEDGER.DAT. The actual number of transactions is also stored in that file and is assigned to the variable NR. All this is performed in lines 380-510. (When setting up a new file, this step is skipped. All elements of CODE\$ and RD\$ are automatically initialized to null strings and NT is initialized to 0.) A pointer to the highest element of the RD\$ array, TR, is initialized to the same value as NR.

Lines 750-1060 perform the assignment of descriptions to the transaction codes by simply setting elements of the array CODE\$ to the description entered.

Lines 1070-1240 control the entry of new transactions. Separate subroutines are used for each field. When the entry is complete, the number of records is incremented as well as the pointer to the top record in the array RD\$. Lines 4150-4180 combine the different fields into a single character string RD\$, which is then stored in the array RD\$.

A variable RN is used to point to the last transaction accessed. When the option FIND/CHANGE TRANSACTION is chosen, the transaction pointed to by RN is retrieved and separated into individual fields by the subroutine on lines 4190-4270. If another transaction is desired, the value of RN is increased or decreased and the process is repeated. If the transaction is to be changed, the same subroutines used for entry are used to change the fields.

When a transaction is deleted, the corresponding entry in the array RD\$ is set to the null character string and NR is decremented. This is performed by lines 1810-1920.

Sorting of transactions is performed in lines 2030-2210. A fairly straightforward procedure similar to a bubble sort is used. Each element of the array RD\$ is processed in

turn. The element being processed is simply compared to each of those already processed and swapped until it has reached its proper place relative to the elements already processed. Deleted entries are easily recognized since they are stored as null strings and are skipped over. When the process is complete, the pointer TR is reset to the same value as NR.

Although this sort process is relatively primitive, it's fairly effective in this situation since most of the array will already be in order.

The printing of a report (lines 2220-3190) is straightforward. Each transaction is printed, with the length of each field determined by the value of a variable set either when the program started or when the user decided to determine a custom format. If minimum or maximum dates were used, any record not falling within that time span is ignored. Similarly, if either code type was specified, any record with a different code is ignored. The total amounts of all the transactions printed are stored in a variable A. When all the transactions have been printed, the value of A is then printed as well after some formatting.

Lines 3200-3410 control the saving of the transactions to disk and exiting the program. All the elements of the array CODE\$ are written to disk, followed by the value of NR (the number of records) and then the non-blank elements of the array RD\$.

Variable	Function
A1	Temporary use
A\$	Input and temporary storage
B0\$	Null string
B1\$	Blank string
B20\$	String of 20 spaces
BS\$	Backspace character
CLRLN	Location of routine to clear line
CODE\$	Array storing code descriptions
CS	Location of routine to clear screen from cursor
D\$	CTRL-D
ESC\$	Escape key
FS\$	Forward space
I,J	Counters, indices
LD,LC,L1,L2,LP,LS,LM	Field lengths used for printing reports
MR	Maximum number of transactions
NC	Number of codes - 1
NR	Number of transactions
QU\$	Quote
R\$	Return key
RD\$	Current transaction
RD\$(*)	Array storing transactions
RN	Pointer to transaction
TR	Pointer to top transaction
T\$,Z\$	Temporary storage
DT\$,CK\$,CD(*),PY\$,DC\$,AMT\$	Fields of current record

Saving Grace

When you're finished, press the Esc key when the main menu is displayed. This selects the SAVE CHANGES/EXIT option. This is how you exit Your Personal Ledger, or how you periodically back up your data file during a long session. (You have one last chance to go back to the menu without saving the changes by pressing Esc again.) Pressing Return saves the changes to disk. At this point, you can re-enter Your Personal Ledger by hitting the Esc key, or end the session entirely by again pressing the Return key.

More Personal

Your Personal Ledger is so simple, yet so powerful, that there's probably little you might want to change. It's set up for a maximum of 400 transactions in order to avoid running out of memory. This is a conservative figure chosen to avoid having to either carefully calculate how much RAM was available for DATA, or to put in sophisticated error detection code to avoid termination of the program if it ran out of memory. That maximum can easily be changed (change the value assigned to MR in line 190) and is an option if your Apple has additional memory and an enhanced version of Applesoft BASIC able to handle that memory.

If your Apple II computer doesn't have this capability, you can still record more than 400 transactions, though this requires additional disks. For instance, you may have to keep two (or more) data disks available. Simply label each disk with the appropriate time frame, say *January-June 1986*. If you have a multitude of transactions to record, you may even have to go to a one-disk-per-month system. (You have to use additional disks since Your Personal Ledger always saves its data to a file called LEDGER.DATA.)

In addition, you may be interested in a graphical depiction of your financial status. The system used to store the data on disk is simple enough so that it would not be difficult to extract the data in a form usable by a standalone graphics program (such as *Visiplot/Visitrend*) or a simple program you might write.

Your Personal Ledger is an easy to use, yet flexible system for keeping track of your financial situation. Indeed, if you'd spent the time it took to read this article using Your Personal Ledger, you'd already have figured out how much you went over budget last month!

Your Personal Ledger

Be sure to use "Apple Automatic Proofreader," found elsewhere in this issue, to enter the following program.

```

61 100 CLRLN = - 868: REM CLEAR TO END OF
      LINE SUBROUTINE
27 110 CS = - 958: REM CLEAR TO END OF SC
      REEN SUBROUTINE
89 120 B0$ = "": B1$ = " ": B20$ = "
      "
3A 130 D$ = CHR$(4): REM CTRL-D
23 140 Q1$ = CHR$(34): REM QUOTE
A1 150 R$ = CHR$(13): REM RETURN
28 160 BS$ = CHR$(8): REM BACK SPACE
DE 170 FS$ = CHR$(21): REM FORWARD SPACE
38 180 ESC$ = CHR$(27)
22 190 MR = 400: REM MAX NO OF RECORDS
B3 200 NC = 25: REM NO. OF CODES
F6 210 DIM CODE$(1,NC), RD$(MR)
7A 220 LD = 8: LC = 5: L1 = 8: L2 = 8: LP = 1
      5: LS = 15: LM = 10: REM DEFAULT REP
      ORT FORMATTING WIDTHS
48 230 HOME
E0 240 Z$ = "YOUR PERSONAL LEDGER": GOSUB
      3420
50 280 VTAB 10
29 290 PRINT "PRESS TO"
7A 300 PRINT "-----"
C9 310 PRINT " 1 USE EXISTING LEDGER
      "
A9 320 PRINT " 2 SET UP NEW LEDGER"
D5 330 GET A$
FE 340 IF A$ = "1" THEN 380
FF 350 IF A$ = "2" THEN 540
9C 360 GOTO 330
24 370 GOTO 290
B3 380 REM EXISTING LEDGER
58 390 HOME
B8 400 Z$ = "PLACE YOUR DATA DISK IN DRIV
      E 1": GOSUB 3420
E9 410 Z$ = "AND": GOSUB 3420
53 420 Z$ = "PRESS <RETURN> TO CONTINUE":
      GOSUB 3420
55 430 GOSUB 3450: REM CLEAR BOTTOM
56 440 GET A$: PRINT
79 450 PRINT D$ "OPEN LEDGER.DATA"
DF 460 PRINT D$ "READ LEDGER.DATA"
A1 470 FOR I = 0 TO 1: FOR J = 0 TO NC: I
      NPUT CODE$(I,J): NEXT J: NEXT I
26 480 INPUT NR: TR = NR
19 490 IF NOT NR THEN 510
2F 500 FOR I = 1 TO NR: INPUT RD$(I): NEX
      T
32 510 PRINT D$ "CLOSE LEDGER.DATA"
67 520 RN = 1: REM SET CURRENT RECORD NUM
      BER
77 530 GOTO 600: REM MAIN MENU
BD 540 REM NEW LEDGER
52 550 HOME
AD 560 Z$ = "PUT FORMATTED DATA DISK IN D
      RIVE 1": GOSUB 3420
F6 570 Z$ = "AND": GOSUB 3420
7C 580 Z$ = "PRESS <RETURN>": GOSUB 3420:
      GET A$
C5 590 NR = 0: INT = 0
50 600 REM MAIN MENU
4B 610 HOME
FE 620 PRINT "PRESS", "TO"
67 630 PRINT "-----", "-----"
EF 640 PRINT " 1", "EDIT TRANSACTION CODE
      S"
5E 650 PRINT " 2", "ENTER TRANSACTION"

```



```

8F 660 PRINT " 3","FIND/CHANGE TRANSACTION"
33 670 PRINT " 4","SORT TRANSACTIONS"
8C 680 PRINT " 5","PRINT REPORT"
F7 690 PRINT
88 700 PRINT "<ESC>","SAVE CHANGES/EXIT"
61 710 GET A$: IF (A$ < "1" OR A$ > "5")
AND A$ < > ESC$ THEN 710
97 720 IF A$ = ESC$ THEN 3200: REM SAVE T
O DISK AND EXIT
9A 730 ON VAL (A$) GOTO 750,1070,1250,203
0,2220
53 740 GOSUB 3450: REM SET SCREEN
8B 750 REM EDIT TRANSACTION CODES
47 760 HOME :Z$ = "EDIT TRANSACTION CODES
": GOSUB 3420
F4 770 PRINT
A0 780 Z$ = "WHICH TYPE CODE": GOSUB 3420
5C 790 Z$ = "PRESS 1 OR 2": GOSUB 3420
6D 800 GET A$: IF A$ < "1" OR A$ > "2" TH
EN 600: REM MAIN MENU
D7 810 I = VAL (A$) - 1
70 820 HOME :Z$ = "EDIT TYPE " + A$ + " T
RANSACTION CODE": GOSUB 3420
2C 830 VTAB 8
29 840 PRINT "CODE","DESCRIPTION"
2F 850 J = 0
5F 860 GOSUB 3450: REM CLEAR BOTTOM
14 870 PRINT "PRESS <-- OR --> FOR OTHER
CODES"
8C 880 PRINT "          <C>      TO CHANGE"
27 890 PRINT "          <ESC>    FOR MENU"
82 900 VTAB 10: HTAB 2: CALL CLRLN
6E 910 PRINT CHR$ ( ASC ("A") + J),CODE$(
I,J)
C9 920 VTAB 10: GET A$
27 930 IF A$ = BS$ THEN J = J - 1: GOTO 9
80
25 940 IF A$ = FS$ THEN J = J + 1: GOTO 9
80
5F 950 IF A$ = ESC$ THEN 600: REM MAIN ME
NU
EB 960 IF A$ = "C" THEN 1010
A6 970 GOTO 920
77 980 IF J < 0 THEN J = NC
E7 990 IF J > NC THEN J = 0
CC 1000 GOTO 900
93 1010 REM EDIT CODE I,J
38 1020 GOSUB 3450:Z$ = "ENTER NEW DESCRI
PTION": GOSUB 3420
11 1030 VTAB 10: HTAB 2: CALL CLRLN
DC 1040 PRINT CHR$ ( ASC ("A") + J),
36 1050 INPUT "":CODE$(I,J)
76 1060 GOTO 860: REM NEXT CODE
80 1070 REM ENTER TRANSACTION
95 1080 IF TR < MR THEN 1120
5C 1090 HOME
43 1100 Z$ = "THERE IS NO ROOM FOR ANY MO
RE RECORDS": GOSUB 3420
02 1110 PRINT : GOSUB 3530: GOTO 600: REM
MENU
42 1120 HOME
41 1130 Z$ = "ENTER TRANSACTION": GOSUB 3
420
8B 1140 GOSUB 3540: REM ENTER DATE
89 1150 GOSUB 3660: REM ENTER CHECK NO.
67 1160 FOR I = 0 TO 1: GOSUB 3730: NEXT
: REM ENTER CODES
C3 1170 GOSUB 3930: REM ENTER SOURCE/PAYE
E
0E 1180 GOSUB 4000: REM ENTER DESCRIPTION
25 1190 GOSUB 4070: REM ENTER AMOUNT

69 1200 GOSUB 3450
75 1210 Z$ = "PRESS <RETURN> TO ACCEPT":
GOSUB 3420
88 1220 GOSUB 3480
39 1230 REM ACCEPT ENTRY
46 1240 NR = NR + 1:TR = TR + 1:RN = TR:
GOSUB 4150
5E 1250 REM FIND/CHANGE TRANSACTION
E3 1260 IF NR = 0 THEN 600: REM MENU
62 1270 GOSUB 4190: REM RETRIEVE RECORD R
N
21 1280 HOME :Z$ = "FIND/DISPLAY TRANSACT
ION": GOSUB 3420
59 1290 GOSUB 3620: REM DISPLAY DATE
DD 1300 GOSUB 3720: REM DISPLAY CHECK NO.
A3 1310 FOR I = 0 TO 1: GOSUB 3920: NEXT
: REM DISPLAY CODES
1F 1320 GOSUB 3990: REM DISPLAY SOURCE/PA
YEE
EA 1330 GOSUB 4060: REM DISPLAY DESCRIPTI
ON
4E 1340 GOSUB 4140: REM DISPLAY AMOUNT
81 1350 GOSUB 3450
33 1360 PRINT "<--"
88 1370 PRINT "<C>HANGE          <J>UMP"
AA 1380 PRINT "<P>RINT          <D>ELETE"
6D 1390 PRINT "<E>NTER          <ESC> ME
NU"
53 1400 GET A$
A9 1410 IF A$ = "J" THEN 1490
E7 1420 IF A$ = BS$ THEN ST = - 1:J = 1:
GOTO 1520
00 1430 IF A$ = FS$ THEN ST = 1:J = 1: GO
TO 1520
98 1440 IF A$ = "C" THEN 1590
89 1450 IF A$ = "D" THEN 1810
C7 1460 IF A$ = "P" THEN 1930
C1 1465 IF A$ = "E" THEN 1070
EC 1470 IF A$ = ESC$ THEN 600
7A 1480 GOTO 1400
F6 1490 GOSUB 3450: INPUT "JUMP HOW MANY
RECORDS (+/-)? ":A$
19 1500 J = INT ( VAL (A$)):ST = 1: IF J
< 0 THEN ST = - 1
3A 1510 J = ABS (J): IF NOT J THEN 1350
0D 1520 FOR I = 1 TO J
6D 1530 RN = RN + ST
D4 1540 IF RN > TR THEN RN = 1
C9 1550 IF RN < 1 THEN RN = TR
D7 1560 IF RD$(RN) = B0$ THEN 1530
91 1570 NEXT I
CB 1580 GOTO 1250: REM FIND/EDIT MENU
E6 1590 REM CHANGE
26 1600 Z$ = "DATE": GOSUB 1760
8A 1610 IF A$ = "C" THEN GOSUB 3540
82 1620 Z$ = "CHECK NUMBER": GOSUB 1760
D3 1630 IF A$ = "C" THEN GOSUB 3660
83 1640 FOR I = 0 TO 1
A9 1650 Z$ = "CODE " + STR$ (I + 1): GOSU
B 1760
9E 1660 IF A$ = "C" THEN GOSUB 3730
93 1670 NEXT I
E1 1680 Z$ = "SOURCE/PAYEE": GOSUB 1760
28 1690 IF A$ = "C" THEN GOSUB 3930
CC 1700 Z$ = "DESCRIPTION": GOSUB 1760
69 1710 IF A$ = "C" THEN GOSUB 4000
0F 1720 Z$ = "AMOUNT": GOSUB 1760
F4 1730 IF A$ = "C" THEN GOSUB 4070
04 1740 GOSUB 4150: REM STORE RECORD
C3 1750 GOTO 1250: REM FIND/EDIT MENU

```



```

01 1760 GOSUB 3450:Z$ = "PRESS <C> TO CHA
NGE " + Z$: GOSUB 3420
52 1770 Z$ = "OR": GOSUB 3420
98 1780 Z$ = "PRESS <RETURN> TO ACCEPT":
GOSUB 3420
2A 1790 GET A$: IF A$ < > R$ AND A$ < > "
C" THEN 1790
E1 1800 RETURN
DA 1810 REM DELETE RECORD
32 1820 GOSUB 3450:Z$ = "PRESS <RETURN> T
O DELETE": GOSUB 3420
44 1830 Z$ = "OR": GOSUB 3420
E5 1840 Z$ = "PRESS <ESC> TO ABORT DELETI
ON": GOSUB 3420
A6 1850 GET A$: IF A$ < > R$ AND A$ < > E
SC$ THEN 1850
22 1860 IF A$ = ESC$ THEN 1250
38 1870 RD$(RN) = B0$
9E 1880 NR = NR - 1
C7 1890 IF NR = 0 THEN 600
6F 1900 RN = RN + 1: IF RN > TR THEN RN =
1
48 1910 IF RD$(RN) = B0$ THEN 1900
7C 1920 GOTO 1250
60 1930 REM PRINT RECORD RN
CD 1940 PRINT : PRINT D$"PR#I"
B2 1950 PRINT "DATE:",DT$
81 1960 PRINT "CHECK NUMBER:",CK$
76 1970 FOR I = 0 TO 1: PRINT "CODE ";I +
1,CODE$(I,CD(I)): NEXT I
59 1980 PRINT "SOURCE/PAYEE:",PY$
8F 1990 PRINT "DESCRIPTION:",DC$
64 2000 PRINT "AMOUNT:",AMT$
F2 2010 PRINT D$"PR#0"
AA 2020 GOTO 1250: REM FIND/EDIT MENU
D4 2030 REM SORT TRANSACTIONS
A4 2040 IF NR = 0 THEN 600
83 2050 I = 1:RN = 1
D7 2060 IF RD$(I) = B0$ THEN I = 1 + 1: G
OTO 2060
51 2070 IF I < > 1 THEN RD$(I) = RD$(I):R
D$(I) = B0$
4A 2080 IF NR = 1 THEN TR = 1: GOTO 600:
REM MENU
FD 2090 J = 2: REM NEXT RECORD PLACE
9A 2100 FOR I = 2 TO NR
95 2110 IF RD$(J) = B0$ THEN J = J + 1: G
OTO 2110
D4 2120 IF I < > J THEN RD$(I) = RD$(J):R
D$(J) = B0$
31 2130 I1 = I - 1:I2 = I
8D 2140 IF I1 = 0 THEN 2180
88 2150 IF RD$(I1) < RD$(I2) THEN 2180
16 2160 T$ = RD$(I1):RD$(I1) = RD$(I2):RD
$(I2) = T$
9D 2170 I2 = I1:I1 = I1 - 1: GOTO 2140
1D 2180 J = J + 1
92 2190 NEXT I
81 2200 TR = NR
A3 2210 GOTO 600: REM MENU
85 2220 REM REPORT
45 2230 HOME :Z$ = "PRINT REPORT": GOSUB
3420
68 2240 GOSUB 3450:Z$ = "PRESS <RETURN> T
O ACCEPT DEFAULT FORMAT": GOSUB 3
420
41 2250 Z$ = "OR": GOSUB 3420
7D 2260 Z$ = "PRESS <C> TO CHANGE FORMAT"
: GOSUB 3420
88 2270 GET A$: IF A$ < > R$ AND A$ < > "
C" THEN 2270
92 2280 IF A$ = R$ THEN 2496
8C 2290 REM CHANGE FORMAT
5D 2300 HOME :Z$ = "PRESS RETURN TO ACCEP
T EACH FIELD": GOSUB 3420
33 2310 Z$ = "OR": GOSUB 3420
65 2320 Z$ = "ENTER NEW FIELD WIDTH": GOS
UB 3420
87 2330 Z$ = "WIDTH = 0 ==> OMIT FIELD":
GOSUB 3420
8E 2340 VTAB 8: CALL CS: PRINT "DATE",LD
F6 2350 INPUT "":A$: IF A$ < > B0$ THEN L
D = VAL (A$): GOTO 2340
C8 2360 VTAB 9: CALL CS: PRINT "CHECK NUM
BER",LC
1F 2370 INPUT "":A$: IF A$ < > B0$ THEN L
C = VAL (A$): GOTO 2360
8A 2380 VTAB 10: CALL CS: PRINT "CODE 1",
L1
25 2390 INPUT "":A$: IF A$ < > B0$ THEN L
1 = VAL (A$): GOTO 2380
AF 2400 VTAB 11: CALL CS: PRINT "CODE 2",
L2
36 2410 INPUT "":A$: IF A$ < > B0$ THEN L
2 = VAL (A$): GOTO 2400
12 2420 VTAB 12: CALL CS: PRINT "SOURCE/P
AYEE",LP
42 2430 INPUT "":A$: IF A$ < > B0$ THEN L
P = VAL (A$): GOTO 2420
31 2440 VTAB 13: CALL CS: PRINT "DESCRIPT
ION",LS
EA 2450 INPUT "":A$: IF A$ < > B0$ THEN L
S = VAL (A$): GOTO 2440
9F 2460 VTAB 14: CALL CS: PRINT "AMOUNT",
LM
72 2470 INPUT "":A$: IF A$ < > B0$ THEN L
M = VAL (A$): GOTO 2460
A0 2480 GOSUB 3470
DD 2490 HOME :Z$ = "SELECTION": GOSUB 342
0
72 2500 GOSUB 3450
55 2510 Z$ = "PRESS <RETURN> TO ACCEPT AL
L DATES": GOSUB 3420
38 2520 Z$ = "OR": GOSUB 3420
A4 2530 Z$ = "PRESS <C> TO CHOOSE PARTICU
LAR DATES": GOSUB 3420
FB 2540 GET A$: IF A$ < > R$ AND A$ < > "
C" THEN 2540
95 2550 D1$ = B0$: IF A$ = R$ THEN 2610
A1 2560 GOSUB 3450: PRINT "FROM:", : GOSUB
2590:D1$ = T$
C2 2570 PRINT "TO:", : GOSUB 2590:D2$ = T$
86 2580 GOTO 2610
E2 2590 T$ = B0$: PRINT "MONTH (MM): ";:
GOSUB 2600: PRINT : PRINT "YEAR
(YY): ";: GOSUB 2600: PRINT : T
$ = RIGHT$ (T$,2) + LEFT$ (T$,2):
RETURN
70 2600 FOR I1 = 1 TO 2: GET A$: PRINT A$
,:T$ = T$ + A$: NEXT : RETURN
78 2610 FOR I = 0 TO 1
55 2620 VT = 8:HT = 1: GOSUB 3460:Z$ = "C
HOOS E CODE " + STR$ (I + 1): GOSU
B 3420
EE 2630 GOSUB 3450:Z$ = "PRESS <RETURN> T
O ACCEPT ALL CODES": GOSUB 3420
45 2640 Z$ = "OR": GOSUB 3420
DF 2650 Z$ = "PRESS <C> TO CHOOSE PARTICU
LAR CODE": GOSUB 3420
10 2660 GET A$: IF A$ < > R$ AND A$ < > "
C" THEN 2660
D6 2670 C(I) = - 1: IF A$ = R$ THEN 2800
F3 2680 GOSUB 3450:Z$ = "<--,-->": GOSUB
3420

```



```

9E 2690 Z$ = "PRESS <RETURN> TO ACCEPT":
    GOSUB 3420
FA 2700 J = 0
DB 2710 VTAB 8: HTAB 1: CALL CLRLN: PRINT
    CHR$ ( ASC ("A") + J ), CODE$(I,J)
DB 2720 GET A$: IF A$ < > BS$ AND A$ < >
    FS$ AND A$ < > R$ THEN 2720
BB 2730 IF A$ = R$ THEN 2790
53 2740 IF A$ = BS$ THEN J = J - 1: GOTO
    2760
1D 2750 J = J + 1
95 2760 IF J < 0 THEN J = NC
76 2770 IF J > NC THEN J = 0
8C 2780 GOTO 2710
7A 2790 C(I) = J
7C 2800 NEXT I
C0 2810 PRINT : PRINT D$"PR#1"
74 2820 A = 0
74 2830 PRINT "PERSONAL LEDGER REPORT": P
    RINT
B5 2840 IF D1$ < > B0$ THEN PRINT MID$ (D
    1$,3,2);"/"; LEFT$ (D1$,2);" TO "
    ; MID$ (D2$,3,2);"/"; LEFT$ (D2$,
    2): PRINT
8C 2850 FOR I = 0 TO 1
28 2860 IF C(I) >= 0 THEN PRINT "CODE ";
    I + 1;": "; CODE$(I,C(I)): PRINT
98 2870 NEXT I
28 2880 IF LD THEN PRINT LEFT$ ("DATE" +
    B20$,LD);B1$;
ED 2890 IF LC THEN PRINT RIGHT$ (B20$ + "
    CHECK",LC);B1$;
8C 2900 IF L1 THEN PRINT LEFT$ ("CODE 1"
    + B20$,L1);B1$;
41 2910 IF L2 THEN PRINT LEFT$ ("CODE 2"
    + B20$,L2);B1$;
74 2920 IF LP THEN PRINT LEFT$ ("SOURCE/P
    AYEE" + B20$,LP);B1$;
77 2930 IF LS THEN PRINT LEFT$ ("DESCRIPT
    ION" + B20$,LS);B1$;
F0 2940 IF LM THEN PRINT RIGHT$ (B20$ + "
    AMOUNT",LM);B1$;
93 2950 PRINT : PRINT
8D 2960 RT = RN: FOR RN = 1 TO TR
EA 2970 IF RD$(RN) = B0$ THEN 3150: REM S
    KIP BLANK RECORDS
3D 2980 GOSUB 4190: REM RETRIEVE RECORD
56 2990 IF D1$ = B0$ THEN 3020
12 3000 IF LEFT$ (RD$,4) < D1$ THEN 3150
2E 3010 IF LEFT$ (RD$,4) > D2$ THEN 3150
49 3020 IF C(0) < 0 THEN 3040
AF 3030 IF CD(0) < > C(0) THEN 3150
5A 3040 IF C(1) < 0 THEN 3060
3A 3050 IF CD(1) < > C(1) THEN 3150
C7 3060 IF LD THEN PRINT LEFT$ (DT$ + B20
    $,LD);B1$;
77 3070 IF LC THEN PRINT RIGHT$ (B20$ + C
    K$,LC);B1$;
FE 3080 IF L1 THEN PRINT LEFT$ (CODE$(0,C
    D(0)) + B20$,L1);B1$;
B7 3090 IF L2 THEN PRINT LEFT$ (CODE$(1,C
    D(1)) + B20$,L2);B1$;
DA 3100 IF LP THEN PRINT LEFT$ (PY$ + B20
    $,LP);B1$;
4A 3110 IF LS THEN PRINT LEFT$ (DC$ + B20
    $,LS);B1$;
EB 3120 IF LM THEN PRINT RIGHT$ (B20$ + A
    MT$,LM);B1$;
B1 3130 PRINT
63 3140 A = A + VAL (AMT$)
6F 3150 NEXT RN:RN = RT
AA 3160 A1 = INT (A):A1$ = STR$ (A1):A2$

```

```

= STR$ ( INT (100 * (A - A1) + .1
    )): IF LEN (A2$) = 1 THEN A2$ = "
    0" + A2$
B9 3170 PRINT : PRINT "TOTAL:  $";A1$;".
    ";A2$
78 3180 PRINT D$"PR#0": REM RESET OUTPUT
    TO MONITOR
C2 3190 GOTO 600: REM MENU
D0 3200 REM SAVE ENTRIES/EXIT
42 3210 HOME
6E 3220 Z$ = "PRESS <RETURN> TO SAVE CHAN
    GES": GOSUB 3420
91 3230 GOSUB 3480
82 3240 HOME :Z$ = "SAVING CHANGES": GOSU
    B 3420
99 3250 ONERR GOTO 3410
A6 3260 PRINT D$"OPEN LEDGER.DATA"
28 3270 PRINT D$"WRITE LEDGER.DATA"
6C 3280 FOR I = 0 TO 1: FOR J = 0 TO NC:
    PRINT CODE$(I,J): NEXT : NEXT
84 3290 PRINT NR
8F 3300 IF NOT NR THEN 3360
92 3310 I1 = 1
A5 3320 FOR I = 1 TO NR
2E 3330 IF RD$(I1) = B0$ THEN I1 = I1 + 1
    : GOTO 3330
2D 3340 PRINT QU$;RD$(I1):I1 = I1 + 1
8D 3350 NEXT
28 3360 PRINT D$"CLOSE LEDGER.DATA"
DE 3370 POKE 216,0: REM RESET ONERR
8F 3380 HOME :Z$ = "PRESS <RETURN> TO EXI
    T": GOSUB 3420
AB 3390 GOSUB 3480
CC 3400 END
40 3410 POKE 216,0: GOTO 3200: REM ERROR
    TRAP -- BACK TO CHOICE
EF 3420 REM CENTER DISPLAY
F5 3430 TB = 20 - INT ( LEN (Z$) / 2): IF
    TB < 1 THEN TB = 1
47 3440 PRINT TAB( TB)Z$: RETURN
D3 3450 VT = 18:HT = 1
62 3460 HTAB HT: VTAB VT: CALL CS: HTAB H
    T: VTAB VT: RETURN
6E 3470 Z$ = "PRESS <RETURN> TO CONTINUE"
    : GOSUB 3420
52 3480 Z$ = "OR": GOSUB 3420
8D 3490 Z$ = "PRESS <ESC> TO RETURN TO ME
    NU": GOSUB 3420
5E 3500 GET A$: IF A$ < > R$ AND A$ < > E
    SC$ THEN 3500
84 3510 IF A$ = ESC$ THEN POP : GOTO 600:
    REM MENU
E5 3520 RETURN
8F 3530 VTAB 22:Z$ = "PRESS ANY KEY TO CO
    NTINUE": GOSUB 3420: GET A$: PRIN
    T : RETURN
97 3540 REM ENTER DATE YY/MM/DD
69 3550 REM VTAB 8
1D 3560 REM WIDTH 6
DF 3570 GOSUB 3450: PRINT "DATE:  ";
2D 3580 DT$ = B0$
8F 3590 FOR J = 1 TO 2: GOSUB 3640: GOSUB
    3640:DT$ = DT$ + "/": PRINT "/";
    : NEXT
FC 3600 GOSUB 3640: GOSUB 3640
79 3610 GOSUB 3450
A7 3620 VTAB 8: HTAB 1: CALL CLRLN: PRINT
    "DATE:",DT$: RETURN : REM DISPLA
    Y DATE
EB 3630 RETURN
18 3640 GET A$: IF A$ < "0" OR A$ > "9" T
    HEN 3640

```



```

3F 3650 DT$ = DT$ + A$: PRINT A$;: RETURN
55 3660 REM ENTER CHECK NUMBER
7B 3670 REM VTAB9
17 3680 REM WIDTH5
99 3690 GOSUB 3450
51 3700 INPUT "CHECK NUMBER: ";A$: GOSUB
    3450
CA 3710 CK$ = RIGHT$ (B20$ + A$,5)
87 3720 VTAB 9: HTAB 1: CALL CLRLN: PRINT
    "CHECK NO: ",CK$: RETURN : REM DI
    SPLAY CHECK NO.
F7 3730 REM ENTER CODES
D7 3740 REM I=WHICH CODE (0 OR 1)
79 3750 REM VTAB 10 OR 11
D8 3760 REM WIDTH 1
93 3770 GOSUB 3450
C1 3780 Z$ = "CHOOSE CODE " + STR$ (I + 1
    ): GOSUB 3420
3B 3790 VTAB 22:Z$ = "PRESS <--,--> OR <R
    ETURN> TO ACCEPT": GOSUB 3420
FD 3800 J = 0
35 3810 VTAB 20: CALL CLRLN:Z$ = CHR$ ( A
    SC ("A") + J) + " " + CODE$(I,J
    ): GOSUB 3420
65 3820 GET A$
6E 3830 IF A$ = BS$ THEN J = J - 1: GOTO
    3870
6A 3840 IF A$ = FS$ THEN J = J + 1: GOTO
    3870
87 3850 IF A$ = R$ THEN 3900
8E 3860 GOTO 3820
9C 3870 IF J < 0 THEN J = NC
7D 3880 IF J > NC THEN J = 0

```

```

96 3890 GOTO 3810
74 3900 REM ACCEPT CODE
A7 3910 CD(I) = J
E0 3920 VTAB 10 + I: HTAB 1: CALL CLRLN:
    PRINT "CODE ";I + 1;":",CODE$(I,C
    D(I)): RETURN
34 3930 REM ENTER SOURCE/PAYEE
68 3940 REM VTAB12
F6 3950 REM WIDTH 20
93 3960 GOSUB 3450
84 3970 INPUT "SOURCE/PAYEE: ";A$: GOSUB
    3450
2C 3980 PY$ = LEFT$ (A$ + B20$,20)
8C 3990 VTAB 12: HTAB 1: CALL CLRLN: PRIN
    T "SOURCE/PAYEE:",PY$: RETURN : R
    EM DISPLAY SOURCE/PAYEE
37 4000 REM ENTER DESCRIPTION
53 4010 REM VTAB13
D9 4020 REM WIDTH 20
76 4030 GOSUB 3450
95 4040 INPUT "DESCRIPTION: ";A$: GOSUB
    3450
8B 4050 DC$ = LEFT$ (A$ + B20$,20)
C0 4060 VTAB 13: HTAB 1: CALL CLRLN: PRIN
    T "DESCRIPTION:",DC$: RETURN
8A 4070 REM ENTER AMOUNT
7F 4080 REM VTAB14
58 4090 REM WIDTH 9
EA 4100 GOSUB 3450: INPUT "AMOUNT: ";A$:
    GOSUB 3450
8A 4110 A = VAL (A$):A1 = INT (A):A2 = IN
    T (100 * (A - A1) + .1)
98 4120 A2$ = STR$ (A2): IF LEN (A2$) = 1
    THEN A2$ = "0" + A2$
6F 4130 AMT$ = RIGHT$ (B20$ + STR$ (A1) +
    ". " + A2$,9)
D5 4140 VTAB 14: HTAB 1: CALL CLRLN: PRIN
    T "AMOUNT:",AMT$: RETURN : REM DI
    SPLAY AMOUNT
82 4150 REM STORE RECORD RN
C5 4160 RD$ = MID$ (DT$,7,2) + MID$ (DT$,
    1,2) + MID$ (DT$,4,2) + CK$ + CHR
    $(CD(0) + ASC ("A")) + CHR$ (CD(
    1) + ASC ("A")) + PY$ + DC$ + AMT
    $
63 4170 RD$(RN) = RD$
F6 4180 RETURN
DF 4190 REM RETRIEVE RECORD RN
A9 4200 RD$ = RD$(RN): REM RECORD DATA
46 4210 DT$ = MID$ (RD$,3,2) + "/" + MID$
    (RD$,5,2) + "/" + MID$ (RD$,1,2)
    : REM DATE
D6 4220 CK$ = MID$ (RD$,7,5): REM CHECK N
    O.
CF 4230 FOR II = 0 TO 1:CD(II) = ASC ( MI
    D$ (RD$,12 + II,1)) - ASC ("A"):
    NEXT : REM CODES 1 & 2
3A 4240 PY$ = MID$ (RD$,14,20): REM PAYEE
    /SOURCE
6B 4250 DC$ = MID$ (RD$,34,20): REM DESCR
    IPTION
65 4260 AMT$ = MID$ (RD$,54,9): REM AMOUN
    T
F4 4270 RETURN

```

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Keynote

Patrick Parrish, Programming Supervisor

Many personal computers offer the user some sort of aural feedback with each keystroke. "Keynote" makes this capability available for the Apple II-series computer using either DOS 3.3 or ProDOS.

Most of us can't touch type. We may not be of the "hunt and peck" school of typists, but we don't blitz through typing at 60 words per minute either. We're somewhere in the middle.

Auditory feedback while we type is thus something appreciated. Some computers provide this, a blip perhaps or a beep. It makes it easier to tell when a key's been pressed. Unfortunately, the Apple II computers don't have this feature. Until now.

With "Keynote", you'll hear a tone with each keypress. It doesn't matter whether you're in immediate mode or within a program. Furthermore, this tone can be altered to suit your ears or even turned off.

Short And Simple

Keynote is a short 52-byte machine language routine loaded into the Apple by a BASIC loader. Carefully type in the program listing below and save a copy to disk before you run it. When you run the BASIC loader, line 100 POKes the machine language code into memory, starting at location 924 (that's \$39C in hexadecimal notation). This area is safe from BASIC on the Apple, so Keynote shouldn't interfere with or be overwritten by most programs. Next, line 110 saves a copy of Keynote as a binary file (entitled KEYNOTE) to disk, then ends the program. (Because the BASIC program uses the name KEYNOTE for the machine language file it writes to disk, you must use some other name when you save the BASIC program. If you save the BASIC program with the name KEYNOTE, you'll get a FILE TYPE MISMATCH error when you run it.)

Keynote is now in memory. To activate it, type CALL 924 and press Return. Now press any key and you should immediately hear a click from the speaker.

You may find this tone annoying, especially after typing for long stretches. Fortunately, Keynote lets you use other notes. Finding a tone to suit your own ear may take some trial and error testing, however. To try other tones, simply POKE values for pitch and duration (both must be in the range of 0-255) into location 974 and 975, respectively, and press a few keys. By default, the pitch has a value of ten and duration of ten (see line 180 in the BASIC loader). Once you've settled on a suitable tone, change the values in line 180 and rerun the BASIC loader. Keynote will thus be resaved with the values you choose. After you have a tone you like, you won't need the BASIC program again—you can just use the binary file it creates. This is explained in detail in the following section.

Note: If you choose a long duration, you'll notice that characters are displayed more slowly than they're entered when you're typing quickly. The tone may also seem to be continuous. It's best to use a relatively low value for the duration.

If you tire of Keynote's incessant clicks altogether, just hit Ctrl-Reset to deactivate it. To run it again, simply CALL 924.

On Your Own

Because Keynote is saved to disk as a binary file, it can easily be loaded and run by other programs, or run from immediate mode. For example, DOS 3.3 automatically boots up any program named HELLO on the disk. To have KEYNOTE load and run when you boot up your disk, simply include this statement in your HELLO program:

```
PRINT CHR$(4)"BRUN KEYNOTE"
```

Likewise, to run Keynote from immediate mode with DOS 3.3, just type:

```
BRUN KEYNOTE
```

If you're using ProDOS, Keynote requires that you first enter BLOAD KEYNOTE, then follow it with a CALL 924. This is necessary since the pointers directing the operating system to Keynote are reset by ProDOS after a BRUN or BLOAD. Thus, if you want a BASIC program

to automatically run Keynote from ProDOS, just include this statement:

PRINT CHR\$(4)"BLOOD KEYNOTE":CALL 924

Of course, you can use Keynote from immediate mode in ProDOS, too. Just type:

BLOOD KEYNOTE: CALL 924

How It Works

Keynote works much the same in both DOS 3.3 and ProDOS. In both operating systems, a *wedge* is used. The input vectors which normally point to the keyboard input subroutine (KEYIN) at location 64795 (\$FD1B) are changed to point to the starting location of Keynote. Once this is done, Keynote jumps to KEYIN. KEYIN waits for a key to be pressed, and when one is, the routine returns control to Keynote. This produces a tone, and in turn, returns to BASIC.

Before all this can happen, though, Keynote must go through a short initialization routine to determine which operating system is being used. This is done by looking at location 191 (\$BF), the starting location for ProDOS's global page. When ProDOS boots, the value in location 191 is always 76 (representing the JMP instruction). If 76 is indeed the value at this

location, the vectors pointing to KEYIN (CHIN1 at 48690-48691 [\$BE32-\$BE33]) are loaded in low byte/high byte format with the Keynote's starting address (949 [\$3B5]) and control is returned to BASIC.

If the value at location 191 is anything other than 76, Keynote assumes it's in DOS 3.3. In this case, the input vectors (KSW, for KeySWitch) at 56-57 (\$38-\$39), which normally point to KEYIN, are loaded with Keynote's starting address. A jump to a routine at 1002 (\$3EA) updates the input pointers with these new values, reconnects DOS, and returns to BASIC. With either operating system, Keynote is called and a tone is generated with each keypress.

Keynote BASIC Loader

Be sure to use "Apple Automatic Proofreader," found elsewhere in this issue, to enter the following program.

```
10 100 FOR I = 924 TO 975: READ A: POKE I
    ,A: NEXT
19 110 PRINT CHR$ (4)"BSAVE KEYNOTE,A$39C
    ,L$34": END
00 120 DATA 162,181,160,3,173,0,191,201
FF 130 DATA 76,208,7,142,50,190,140,51
19 140 DATA 190,96,134,56,132,57,76,234
47 150 DATA 3,32,27,253,32,74,255,172
A6 160 DATA 207,3,174,206,3,173,48,192
59 170 DATA 202,208,253,136,208,244,32,63
29 180 DATA 255,96,100,10: REM LAST 2 VAL
    UES ARE PITCH, DURATION
```

aa



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Attention Programmers And Writers

COMPUTE!'s Apple Applications Special is always looking for submissions from writers and programmers. If you've got a high quality program for the Apple II series or the Macintosh that you think is a powerful application of the computer, send it to the Editor, *Apple Applications Special*, 324 W. Wendover Ave., Greensboro, NC 27408. All programs must be written in BASIC (Microsoft BASIC 2.0 or higher for the Macintosh) or assembly language, and should be submitted on disk.

Authors who would like to write tutorial or feature-oriented articles should first address a query letter to the Editor.

Personal Publishing With Your Macintosh

Sharon Zardetto Aker

Personal publishing—the ability to create attractively designed publications—doesn't take expensive software. With your Macintosh, MacPaint, MacWrite, and Microsoft Word, you can produce announcements, newsletters, greeting cards, and more. This tutorial shows you the ins and outs of simplified personal publishing.

The Macintosh is getting quite a reputation as the workhorse in desktop publishing. In fact—because of its high screen resolution, ease of use, and graphics-handling capabilities—the Macintosh is partially responsible for creating desktop publishing.

Fortunately, you don't need a specialized page-layout program—like *ReadySetGo*, *MacPublisher*, or *PageMaker*—to do your personal publishing on the Macintosh. You already have *MacPaint* and *MacWrite*, and you probably even have *Microsoft Word*. With those three applications, you can create announcements, newsletters, pamphlets, and even greeting cards. Of course, if publishing things like these is your main computer activity, you'll want to look into one of the specialized programs. But if such publishing is only an occasional activity, you can stick with the generic graphics and word processing software and get perfectly fine results.

As with any other area of computing, knowing a few tricks and techniques makes your work easier. Let's start with two com-

plementary subjects—handling text in *MacPaint*, and handling graphics in a word processor.

MacPaint Text

The basic way to enter text in *MacPaint* is to select the Text tool, click anywhere in the window, and type away. As long as the text is *active*, you can keep typing, use the Backspace key to erase, or press Return to begin another line. If you make a selection from one of the text menus (*Font*, *Size*, or *Style*), all the active text is immediately changed.

Once you leave the text mode—by clicking the mouse, for instance—the text is no longer text, no matter what it looks like to you. To *MacPaint*, it's just a collection of dots like any other section of the picture. This makes it very difficult to change something, or to line up new text with the old. Use these techniques to make basic text entry easier:

- Turn on the *Grid* option—you can make this selection without de-activating your text. Grid will let you vertically and horizontally align new text with old because the text cursor can only be clicked at certain spots. In fact, the grid matches the normal placement of 12-point Geneva text. If you use it with 9-point text, for example, the vertical alignment will be fine but the horizontal placement—the space from one line to the next when you press Return—is enlarged.

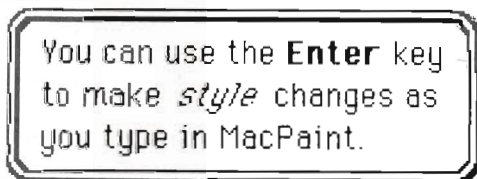
Figure 1: Grid On Or Off

Grid Off	Grid On
This is 12-point Geneva	This is 12-point Geneva
This is 9-point Geneva	This is 9-point Geneva

Typing in MacPaint with and without the Grid option has these results. Notice that Grid matches the normal placement of 12-point Geneva text.

- Use the Enter key to switch text attributes in mid-sentence. While the text is still active press the Enter key, then make a menu selection. The text you already typed won't change, but further typing is done in the new font, size, or style. You can use this Enter trick as many times as you want while you're typing. This makes it easy to insert a single boldface or italicized word in the middle of a sentence.

Figure 2: The Enter Trick



Using the Enter key before selecting a font, size, or style change is an easy way to change text attributes without de-selecting the Text tool.

- Use the Command-key equivalents listed in the menus, whether you're changing all the active text or using the Enter key to switch. Two commands not listed in the menu are Command-comma and Command-period to make the size of text smaller or larger respectively, and Command-Shift-comma and Command-Shift-period to move up or down through the available fonts listed in the *Fonts* menu.

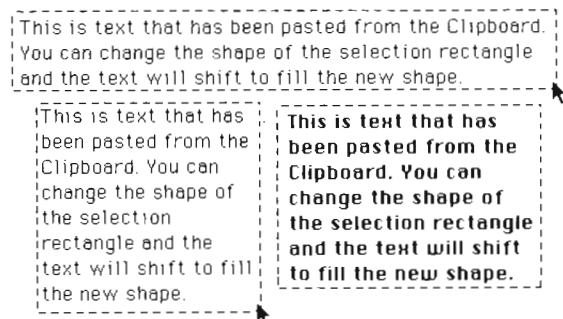
Even when you use MacPaint's text tricks, there's not much leeway in text entry. If you notice a mistake at the beginning of an active block, you have to backspace through everything else to fix it. And, if you've used the Enter key to switch styles, the backspacing ability ends at the place where you switched.

You can, however, take advantage of the fact that MacPaint handles imported text in a special way. Imported text is any text on the

Clipboard. You can bring it in from MacWrite or Word, but the easiest way is to just pull out the Note Pad and type what you want. When you're satisfied, copy the text, put away the Note Pad, and select *Paste*. As long as the marquee selection box is around the text, you can:

- Move it by putting the arrow anywhere inside and dragging.
- Re-size it, in which case the text shifts to fill the new shape. Change the marquee size by holding down the Command key and using the mouse to drag the corner in or out.
- Change the font, size, or style of the marquee contents by using any of the menu selections or keyboard commands—even the justification options work.

Figure 3: Imported Text

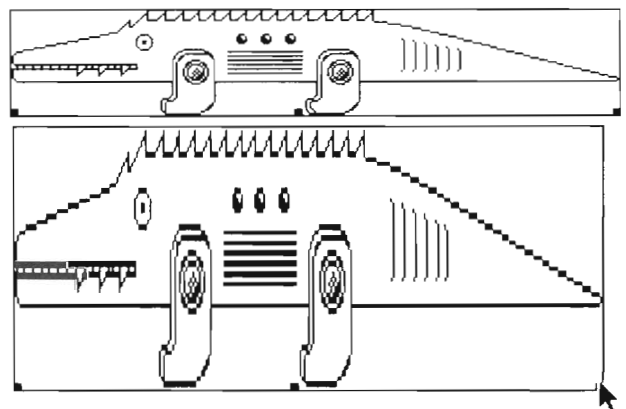


Imported text—anything brought into MacPaint via the Clipboard and the Paste command—can be altered while it is still in the marquee.

Graphics In MacWrite And Word

Importing graphics to MacWrite or Word is as easy as *Copy* and *Paste*, whether you're copying from the Scrapbook or transferring directly from MacPaint via the Clipboard.

Figure 4: Stretching



A selected image in MacWrite or Word is framed—the three small boxes at the bottom of the frame are “handles” which you can use to change the size of the image.

While you can't alter a pasted image, you do have some control over it. Select a picture by clicking on it; a frame with three small handles along the bottom appears around the image. You can change the horizontal or vertical size of the picture by dragging on one of these handles.

In both *MacWrite* and *Word*, you can reposition a selected image by clicking the right or left border, then dragging. *Word* also lets you select *Left*, *Center*, or *Right* alignment from the *Paragraph* menu. You can only shift an image left or right, not up or down.

Unfortunately, you can't type anything to the left or right of a pasted image. So if you need a label, or arrows, or anything else, you'll have to make it part of the image while you're in *MacPaint*.

If the image looks a little squeezed when you first paste it, your document margins are probably narrower than the picture. Select the picture and adjust the margins on the ruler—the picture is automatically re-sized to fit the larger width.

Remember that even though you may choose high-quality printing for your document, any included graphics will still print in standard quality. A fresh ribbon is a necessity for ImageWriter printouts of word-processed documents that include graphics.

To make graphics transfers simpler, consider investing in the program *Art Grabber*, from Hayden software. It's available in the *Body Shop* with *Art Grabber* package as well as in the *MacroMind* Utility Disk release. *Art Grabber* installs as a desk accessory in your Apple menu. With it, you can open any *MacPaint* document and copy the part you need without closing the word processor.

MacPaint Publishing

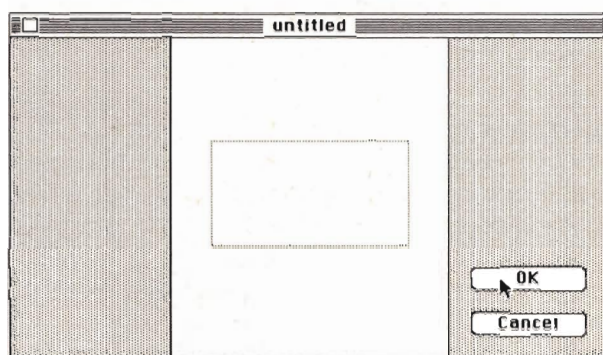
MacPaint is ideally suited for picture-filled single-page announcements. When you design your announcement, keep in mind that even if you draw to the very edge of the window, the document will have built-in margins. *MacPaint* draws on an 8 × 10 inch area of the paper.

You'll need to do a lot of centering for a well-designed announcement. If it's general centering you need—horizontal or vertical—go into *ShowPage* and place the drawing window in the center of the page.

To find the exact center of the window, place a single dot anywhere with the Pencil. Lasso the dot and cut it. Paste it back, and it will appear in the exact center of the window.

For exact vertical centering, you can paint a guideline for yourself—set the window so its

Figure 5: Center With *ShowPage*

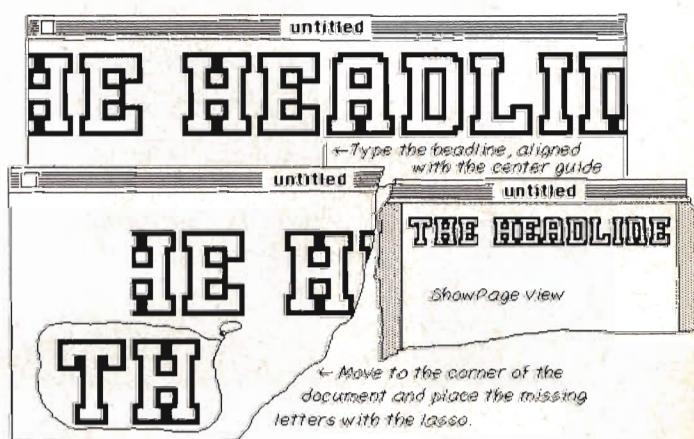


You can get the center of a *MacPaint* document by placing the drawing window while in *ShowPage*.

left edge is at the left edge of the paper, and brush the light dotted pattern (the thirteenth in the top row of the palette) across. (An easier way is to create a filled box with this pattern, then erase it later.) The exact center of the document is the sixteenth dot from the *right* edge of the window. You can use this dot to draw a line down the center to serve as a guide for placing art, headlines, or multi-column text.

With the center guide, you can place a large headline even if it doesn't all fit in the window at once. Move the paper so the center guide is at the middle of the window, select any large type (the example figure uses Athens 72, Outline), and click the text marker on the center guide. Type *THE HEADLINE* with *Middle* alignment set from the *Style* menu. Only the center part of your headline will show—the ends disappear off the edges of the window. Move the paper so you can see its left corner, type *TH* anywhere in the window, lasso it, and move it up to match the text already there. Do the same

Figure 6: Centering A Larger-Than-Window Headline



Centering a headline that's larger than the *MacPaint* window takes several steps, but isn't difficult.

in the right corner of the paper, typing in *NE*.

This same technique can be used to center or move any object larger than the window.

Multiple Printings From MacPaint

You may need only one copy of an announcement that's going to be photocopied. But when you need multiple copies of a page, or single copies of many pages, it's annoying to have to keep pulling down the *Print* command from the *File* menu.

Instead, go back to the deskTop, select the documents you want to print, and choose *Print* from the *File* menu. This opens *MacPaint*, then opens and prints each document in turn. If you want to print multiple copies, make duplicates of the document at the deskTop, select all the copies, and print them from the deskTop.

MacPaint Newsletter

It's not difficult to set up an entire newsletter within *MacPaint*. In fact, if the newsletter has a lot of graphics, it may be easier to handle the text in *MacPaint* than to handle a lot of graphics in a word processor. Besides, in word-processors you can't type to the left or right of an inserted picture. In *MacPaint* you can use the Clipboard text-handling feature to do text wrap-arounds.

Simply draw the picture wherever you want, and paste in small blocks of text, one at a time, around it.

Figure 7: Wrapping Around

Macintosh is a Hit!!!

It's no secret that Apple wants the Mac to make it in the corporate market. Two years into Mac marketing, they changed their

tactic: use the back door. By getting large corporations to view the Mac as the perfect tool for

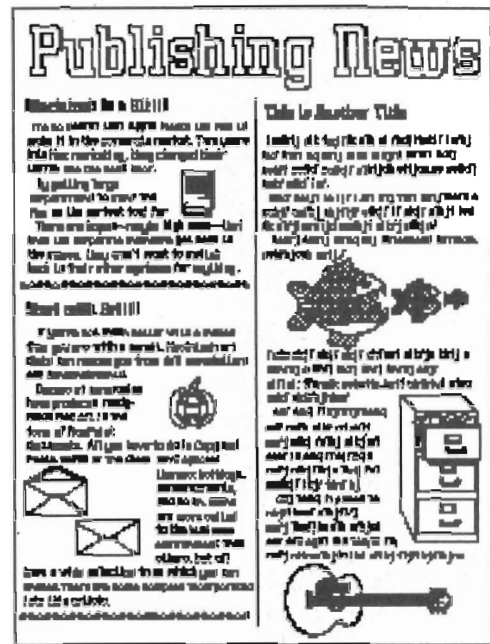


desktop publishing--all sorts of in-house publications benefit from its graphic output--Apple is finally exposing some of the "right" people to the power of the

Create text wrap-around by pasting in separate blocks of text once the image is in place.

Figure 8 shows the ShowPage view of a *MacPaint* newsletter which was created with text wrap-around, an over-sized headline, and a center line dividing columns of text.

Figure 8: A Complete Newsletter



Using the various features of *MacPaint*—such as wrapping text around pictures, creating headlines larger than a window, and a center line guide—you can produce simple newsletters.

MacWrite Newsletters

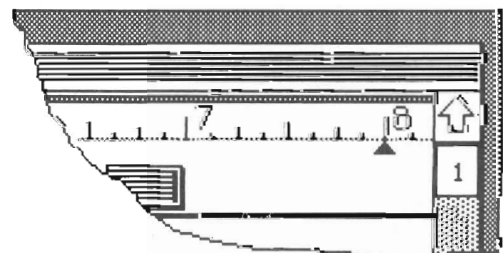
MacWrite is a cinch to use for word processing, but lack of a multi-column print option makes it difficult to use for newsletters. Difficult—but not impossible.

For a single sheet of double-column printing, set the Ruler margins at 1 and 4¼—this gives you 3¼-inches of text. Use the full justification option to make both margins of the text line up neatly.

When you reach the second page, insert another Ruler, and set the margins at 4¾ and 8; this also gives 3¼-inches of text.

Wait...you didn't know you had an 8-inch mark on the ruler? A lot of people don't realize you can stretch the *MacWrite* document a little beyond its default margin settings.

Figure 9: Out-Of-Bounds Ruler



You can get to the 8-inch mark of the ruler by opening the *MacWrite* window as far as possible.

Drag the window about two inches to the left on your screen, then use the size box in the lower corner to stretch the window out as far as possible. You'll see the 8-inch mark on the ruler, and you can set the right margin there.

When you print, there will be a full 1-inch margin at the left of the paper and only a half-inch right margin—you can make them even by adjusting the paper position in the printer.

Now, select *Print* and print only the first page of the document. Roll the paper back in the printer and then print only the second page. The result is two fully-justified columns of text on one sheet of paper.

For a headline which covers both columns, type the headline at the top of the first page, using the widest margins possible and center justification. Begin the second page with enough blank lines so the text will not overprint the headline after the rollback.

If you're printing a multi-page newsletter, you don't have to roll the paper back for every page. Instead, work with three documents:

- Save the main document which contains the entire newsletter.
- Cut out every other page, starting with page 2, and save the document as *Odd pages*.
- Open the main document again, take out every other page starting at page 1, and save the document as *Even pages*.
- Print the *Odd Pages* document, with its margins set so it will be the left column on the page (Ruler set at 1 and 4¼).
- Roll the paper back and print the *Even Pages* document formatted to the right half of the page (Ruler set at 4¾ and 8).

Use a header or footer with the page number only in *one* of the documents, and the newsletter will have numbered pages.

Using Word

Producing newsletters in *Word* is easier than in *MacWrite* because of its multiple-column printing option. Although you won't see the multiple columns on the screen, they'll be neatly printed the way you format them.

There are two items in the *Division Layout* dialog box which pertain to multi-column printing. Specify the number of columns and the space between them, and *Word* automatically sets the Ruler margins to the necessary marks.

Remember that *Word* treats *text* margins and *paper* margins separately. You also have to use the *Page Setup* command in the *File* menu to format your printout. *Page Setup* sets the over-all margins—left, right, top, and bottom.

Figure 10: *Word's* Multi-columns

Two options in *Division Layout* control *Word's* multi-column printout. Here, two columns have been specified, with ½-inch spacing between each column.

The Ruler sets left and right margins within the text area defined in *Page Setup*.

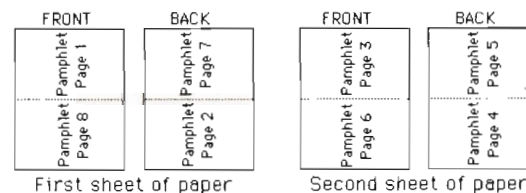
You can't switch from single to multi-column mode on one page, so you can't put a banner headline across the first page and then have multiple columns of printing—you'll have to do a roll-back with the paper again.

Pamphlets

You can take advantage of the *Wide* print option (it prints sideways on the page) with or without *Word's* multiple columns if you want to print pamphlets or brochures. All you have to do is plan ahead—carefully.

If you want an 8-page pamphlet, for instance, you'll need two sheets of paper printed on both sides, folded and nested together. Figure 11 shows the relationship of the pamphlet pages to the paper.

Figure 11: Pamphlet Pages



Careful planning is the key to correct placement of pages when you're putting together a pamphlet.

The problem is that *Word* considers each pamphlet page as a column, so pamphlet pages 1 and 2 would be on one sheet, 3 and 4 on the next, and so on—not at all what is shown in the illustration. You can, however, get around this problem.

Type in all the text, pasting in graphics if you want. Use a page break when you want a

column (pamphlet page) to end.

Use *Division Layout* to specify two columns with one inch separating them. This will change your onscreen margins to 0 and 2½. Then, use *Page Setup* to select the *Wide* print option and change the left and right paper margins to .5 inches. The Ruler margin in your document automatically changes to 4½, reflecting the paper margin changes.

Print a standard quality copy of the document (draft quality is not available for *Wide* printing).

Now, insert a page break in your document wherever a column ends in your printed copy. Select *Repaginate* from the *Document* menu so *Word* will be able to show the new page number in the corner of the window as you scroll through the document.

Now, the tricky part:

- Open a new document, and place the windows side by side on your screen.
- With the original window active, use the *Go To Page* command to skip to page 8. Select all of page 8, excluding any page breaks, and copy it.
- Click in the new window and paste page 8 in the new document.
- Move back to the original document, and select and copy page 1.
- Paste page 1 in the new document on the line immediately following page 8.
- Transfer page 6, and then page 3, to the new document.
- Open another new document and transfer pages 2, 7, 4, and 5, in that order.

Before you print the first of the new documents, check the text at the first line of each column—it may be indented as if it were the beginning of a paragraph, when it's really only a continuation of a paragraph from the previous column. Adjust the formats of the paragraphs if necessary.

Print the first of the new documents, put the paper back in the printer, and print the second document on the reverse side.

When everything is folded and nested together, your text will be back in the right order. Make sure you use heavy stock so the ink won't bleed through to the other side.

This example works for an 8-page pamphlet. For longer pamphlets, or ones with multiple columns on each page (you use a small font size and have *Word* print 4 columns to a page to get 2 on each pamphlet page), the order of pages in the new documents will change a little.

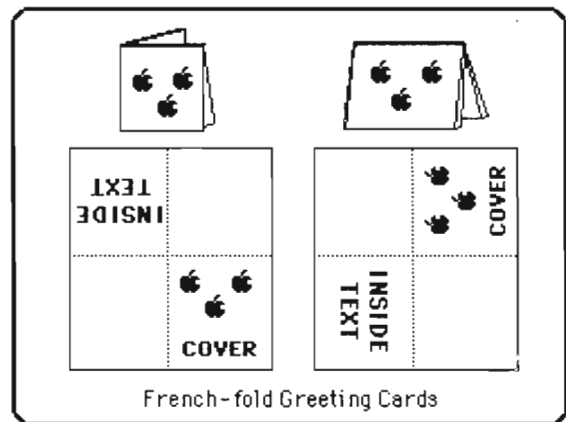
Greetings

Back to *MacPaint* for a quick lesson in greeting cards...

To avoid having to run the paper through the printer twice to print both sides, use what is known as the *French fold*. In this way, you can use only one side of the paper and print both the cover and the inside of the card.

Figure 12 shows how to plan the card—the facing of your picture and text depends on whether the final fold will be at the top of the card or at the left.

Figure 12: French-folded Greeting Card



Designing greeting cards with a French fold avoids having to put the paper through the printer twice.

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Sharon Zardetto Aker is a freelance writer who specializes in the Macintosh. Her work regularly appears in Apple-specific magazines, and her new book, *Using Microsoft Works* (COMPUTE! Books), will be released early this summer.

COMPUTE! magazine, published monthly, covers a wide range of personal computers, including the Apple II line. Each month you'll find Apple-specific programs within the pages of **COMPUTE!**. Some of the programs which have appeared in past issues include "SpeedScript," a word processor, "SpeedCalc," an all-machine language spreadsheet, "Keyboard Customizer," and "MultiMemory."

Look for the **COMPUTE!** subscription advertisement in this issue.

Lexitron

Ron Wilson

Apple version by Tim Victor, Editorial Programmer

Like a bowl of alphabet soup, the "Lexitron" screen appears to be just a jumbled mass of letters. Can you find the ten hidden words before time runs out? A challenging game with three skill levels for the Apple II-series computers in either DOS 3.3 or ProDOS.

If you enjoy the hidden word games often found in newspapers and magazines, you'll like "Lexitron." Unlike those you solve with pencil and paper, Lexitron includes a few twists. There's a time limit—and you can select one of three difficulty levels.

The game is written entirely in BASIC for the Apple II+, IIe, and IIfx computers (running under either DOS 3.3 or ProDOS). After typing it in, be sure to save a copy.

Be especially careful as you type in the DATA statements in lines 1200 and 1210. These lines hold Lexitron's word pool.

Side To Side, Top To Bottom

With Lexitron on disk, simply type:

RUN LEXITRON

(assuming you've named the program **LEXITRON** on the disk).

After a few moments, you'll see the game's three different skill levels.

- Level 1—All the hidden words are spelled left to right, or top to bottom. No diagonals are used.
- Level 2—More difficult, it includes words formed in reverse order (from right to left or bottom to top), as well as forward-spelled words. Again, no diagonals are used.
- Level 3—The most difficult, with both forward and reversed diagonal words being formed. You

might want to stay clear of level 3 until you've played a few times.

Once you've chosen a skill level by pressing the appropriate number key, hit Return. The screen will clear for a few seconds while the game words are being selected and hidden. Don't leave your seat—the timer starts as soon as the game appears on the screen.

Using the cursor keys, move the cursor to any word you've found and press the Return key while the cursor is on each letter in that word. You'll have to keep pressing one of the cursor keys, then the Return key, to complete the word. If you're entering characters in a hidden word, you'll see the message *Good Answer* at the bottom of the screen. Pressing the Return key on an incorrect letter gives you *Try Another*. When you've entered an entire hidden word, the words *Well Done* appear.

If you have an Apple II+—which has only left and right cursor keys—use the following Control key combinations to move the cursor up and down.

Up: Ctrl-K

Down: Ctrl-J

Notice that the cursor wraps around the screen. In other words, if the cursor is on the top line and you press the cursor up key, the cursor appears on the bottom line of the game board. Ditto for the left and right edges. This can speed things up when you're rushing to get to that last word and the time is almost up.

Each time a correct letter is registered, the time level, which moves from top to bottom, is pushed back toward the top. Avoid guessing letters by trial and error. Wrong entries only reduce the amount of time. When the time reaches the bottom of the screen, the game ends. All the hidden words are highlighted and you'll have the option to play another game, or stop.

All valid game words are at least six letters long. This keeps the accidental (and sometimes humorous) letter combinations from taking your time and effort. You'll often see words like MAN, CAR, SEE, or TRY, but Lexitron doesn't recognize them. Also be aware of letter additions. For example, Lexitron may choose and hide the word AMERICA, but by sheer chance the letter following could be an N, making AMERICAN. Lexitron may not recognize the extra N.

Easy Changes

The Lexitron vocabulary words are coded so that players can't list the program and get an illegal sneak preview. If you want to add your own words, or even entirely replace those in the program, the code is simple. Each letter represents the letter which alphabetically follows. For example, the letter A is coded as B.



Though there's plenty of time remaining, the player has found only four of the ten hidden words in this level 1 game of Lexitron.

ABACUS would be coded as BCB DVT. If you decide to add your own words, start with a new line—1220—and remember that all words must be at least six letters long. *Be sure the last word in the list is FOE* (END in code). This signals the program that it's reached the end of the word list. You might want to avoid using words with the letters X, Z, or the Q-U combination. A sharp player can spot words with those letters in seconds. By the way, if you *do* want to use the letter Z, enter a left bracket character ([) as code in the DATA statement.

Lexitron, as it's written, can have a total of 200 words (not counting FOE) in its list. However, it will randomly select only ten from that list to include on the board.

If you find Lexitron too easy or too difficult, you can change the value .009 in line 330. This controls the timer. Raising and lowering this value changes the allotted time, and thus the difficulty of the game. A value less than .009 (such as .007) makes the game easier, and, conversely, increasing the value makes it more difficult.

There are a few strategies to consider when playing Lexitron. For instance, in some cases it's not to your best advantage to enter a word as soon as you find it. If you have trouble finding some of the hidden words, Lexitron randomly provides a clue by flashing a word at the bottom of the screen.

Lexitron

Be sure to use "Apple Automatic Proofreader," found elsewhere in this issue, to enter the following program.

```

62 100 HOME : HTAB 11: DIM AR$(20,15),AR(
    20,15),LN(200)
88 105 DEF FN Z(X) = 1664 + 128 * X - INT
    ((X + 5) / 8) * 984
DF 110 FOR A = 0 TO 10: READ Q(A): NEXT
78 120 FOR A = 0 TO 8: READ D(A): NEXT
08 125 DATA 0,1,5,0,7,8,6,0,3,2,4,0,-40,-
    39,1,41,40,39,-1,-41
10 130 DIM L(200): HTAB 4: PRINT "PLEASE
    WAIT WHILE LOADING WORDS"
59 170 GOSUB 1160: GOSUB 1120
F1 180 GOSUB 1090
BF 190 GW = 0: FOR A = 0 TO 19: FOR B = 0
    TO 14: AR(A,B) = 0: NEXT B, A: FOR
    A = 0 TO NW: L(A) = 0: NEXT : PX = 0
    : PY = 0
C5 200 HOME : LL = 7: VTAB 6: HTAB 13: PRI
    NT "CHOOSE A LEVEL"
88 220 VTAB 8: HTAB 5: INVERSE : PRINT "1
    "; NORMAL : PRINT " ALL WORDS SP
    ELLED FORWARDS,": HTAB 10: PRINT "
    NO DIAGONALS"
78 230 VTAB 11: HTAB 5: INVERSE : PRINT "
    2"; NORMAL : PRINT " FORWARD & R
    EVERSED SPELLINGS,": HTAB 10: PRIN
    T "NO DIAGONALS"
7C 240 VTAB 14: HTAB 5: INVERSE : PRINT "
    3"; NORMAL : PRINT " FORWARD & R
    EVERSED SPELLINGS,": HTAB 10: PRIN
    T "DIAGONALS INCLUDED"
56 250 GOSUB 410: IF A$ < "1" OR A$ > "3"
    THEN 250
E9 260 LV = VAL (A$)
C3 290 HOME : GOSUB 970
09 300 HOME : HTAB 12: PRINT "L E X I T R
    O N": GOSUB 850: QF = 1: T = 1
5F 310 REM PLAY LOOP
60 315 SP = 1: CP = 1664 + 128 * PY - INT
    ((PY + 5) / 8) * 984 + PX + 9: OC =
    PEEK (CP): PC = 32 * (INT (OC / 3
    2)) - 128 * (OC < 128)
85 320 IF RND (1) < .003 THEN GOSUB 670
7C 330 IF RND (1) < .009 THEN GOSUB 540
48 340 POKE CP, OC - SP * PC: SP = 1 - SP:
    GOSUB 410
90 345 IF A$ = "" THEN 320
07 348 POKE CP, OC

```



```

E7 350 IF A$ = CHR$ (8) THEN PX = PX - 1:
    IF PX = - 1 THEN PX = 19: GOTO 37
    5
00 360 IF A$ = CHR$ (21) THEN PX = PX + 1
    : IF PX = 20 THEN PX = 0: GOTO 385
93 370 IF A$ < > CHR$ (11) THEN 380
13 375 PY = PY - 1: IF PY = - 1 THEN PY =
    14
55 380 IF A$ < > CHR$ (10) THEN 390
4A 385 PY = PY + 1: IF PY = 15 THEN PY =
    0
F7 390 IF A$ = CHR$ (13) THEN GOSUB 430
99 400 GOTO 315
C0 405 REM GET KEY
8E 410 IF PEEK (49152) > 127 THEN A$ = CH
    R$ ( PEEK (49152) - 128): POKE 491
    68,0: RETURN
82 415 A$ = "": RETURN
82 420 REM LETTER SELECTED
04 430 VTAB 24: HTAB 15
ED 440 IF AR(PX,PY) = 0 THEN PRINT "TRY A
    NOTHER";: GOSUB 540: RETURN
7F 450 PRINT "GOOD ANSWER";
EE 460 VTAB PY + 6: HTAB PX + 10: INVERSE
    : PRINT (AR$(PX,PY));: NORMAL
59 470 T = AR(PX,PY) - 1:L(T) = L(T) + 1
79 510 FOR TD = 1 TO 400: NEXT : GOSUB 59
    0:DL = LL:LL = LL + (LL < 15): GOS
    UB 550:AR(PX,PY) = 0: IF L(T) = LN
    (T) THEN GOSUB 610
19 520 RETURN
89 530 REM ENERGY DRAIN
FB 540 DL = LL:LL = LL - 1: IF LL = - 1 T
    HEN GOSUB 700
FB 550 VTAB 21 - OL: HTAB 4: PRINT "!";:
    HTAB 36: PRINT "!"
90 565 VTAB 21 - LL: HTAB 4: INVERSE : PR
    INT " ";: HTAB 36: PRINT " ": NORM
    AL
23 570 RETURN
F0 580 REM CLEAR MESSAGE
87 590 VTAB 24: HTAB 1: PRINT SPC( 39);:
    RETURN
5D 600 REM GOT A WORD
0E 610 GW = GW + 1: IF GW = 10 THEN 770
A5 620 VTAB 24: HTAB 16: PRINT "WELL DONE
    !";: FOR TD = 1 TO 400: NEXT
A9 650 GOSUB 590: RETURN
EA 660 REM GIVE A CLUE
25 670 A = RND (1) * 10: IF L(A) = 0 THEN
    VTAB 24: HTAB 1: PRINT "CLUE:"W$(
    A + M);: FOR T = 1 TO 800: NEXT
AF 680 GOSUB 590: RETURN
77 690 REM END OF GAME
4B 700 INVERSE : FOR A = 0 TO 14: VTAB A
    + 6: FOR B = 0 TO 19
03 710 IF AR$(B,A) < > " " THEN HTAB B +
    10: PRINT AR$(B,A);
96 730 NEXT B,A: NORMAL : VTAB 24: HTAB 7
    : PRINT "PRESS ANY KEY TO CONTINUE
    ";: GET A$
41 760 GOSUB 590: VTAB 24: HTAB 8: PRINT
    "SORRY, YOU DIDN'T MAKE IT";: GOTO
    790
6E 770 VTAB 24: HTAB 8: PRINT "CONGRATULA
    TIONS, YOU WON!";
62 790 FOR I = 1 TO 1000: NEXT : GOSUB 59
    0: VTAB 23: HTAB 12: PRINT "PRESS
    Q TO QUIT,"
34 800 VTAB 24: HTAB 7: PRINT "ANY OTHER

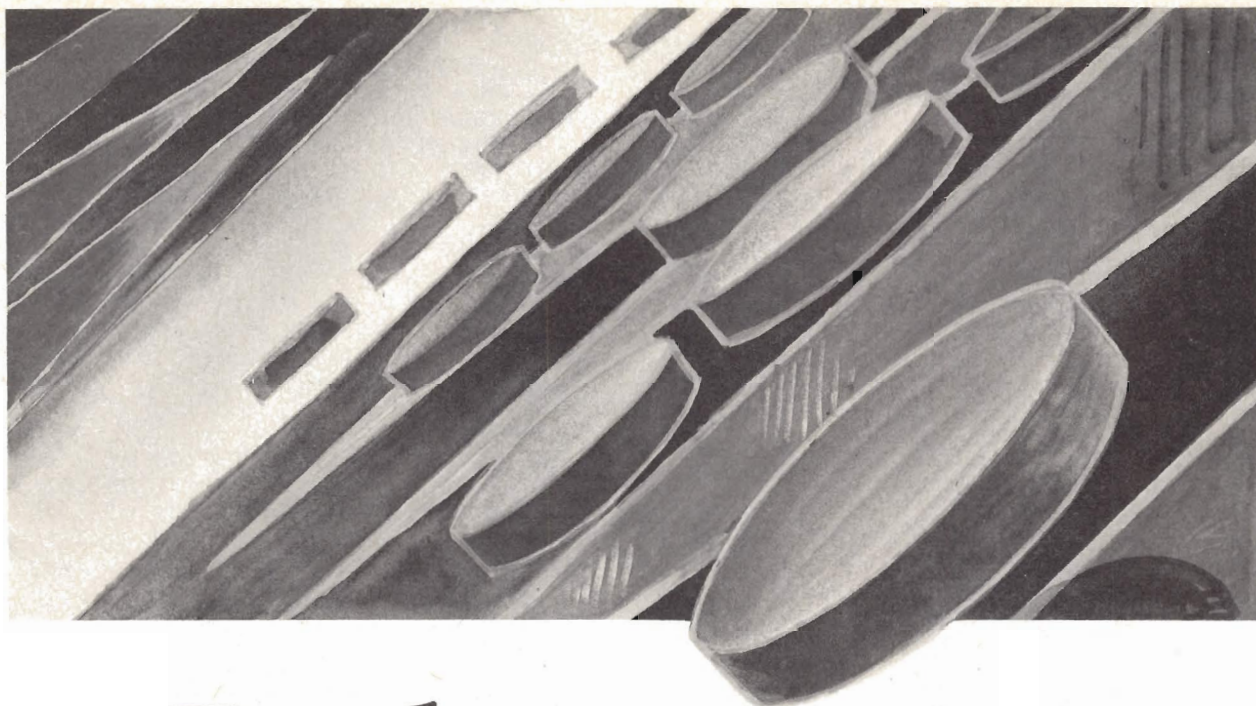
```

```

KEY TO PLAY AGAIN";
EC 810 GET A$: VTAB 23: HTAB 1: PRINT SPC
    ( 39);: GOSUB 590: IF A$ = "Q" OR
    A$ = "q" THEN END
85 820 GOSUB 1170: GOTO 180
DC 840 REM PRINT ARRAY
26 850 FOR X = 6 TO 21: VTAB X: HTAB 4: P
    RINT "!";: HTAB 36: PRINT "!": NEX
    T
6F 860 GOSUB 565
6E 900 FOR A = 0 TO 14: VTAB A + 6: HTAB
    10: FOR B = 0 TO 19
8A 910 IF AR$(B,A) = " " THEN PRINT CHR$
    (65 + RND (1) * 26);: GOTO 930
EE 920 PRINT AR$(B,A);
C8 930 NEXT : NEXT
23 950 RETURN
21 960 REM PUT WORDS IN THE ARRAY
C9 970 VTAB 24: HTAB 8: PRINT "BUILDING N
    EW LEXITRON BOARD";
FC 975 B = INT ( RND (1) * (NW - 10))
EI 980 M = B: FOR A = 0 TO 9:W$ = W$(B +
    A)
18 990 DR = RND (1) * 2 ^ LV:DY = DY(DR):
    DX = DX(DR):L = LEN (W$)
18 1000 SX = INT ( RND (1) * 19 + 1):SY =
    INT ( RND (1) * 14 + 1):RX = SX:
    RY = SY
7D 1010 NX = SX + (L - 1) * DX:NY = SY +
    (L - 1) * DY: IF NX < 0 OR NY < 0
    OR NX > 19 OR NY > 14 THEN 990
89 1020 FL = 0: FOR L = 1 TO LEN (W$): IF
    AR$(SX,SY) < > " " THEN FL = 1:L =
    LEN (W$)
98 1030 SX = SX + DX:SY = SY + DY
17 1040 NEXT : IF FL THEN A = A - 1: NEXT
7F 1050 FOR L = 1 TO LEN (W$):AR$(RX,RY)
    = MID$ (W$,L,1)
A6 1060 AR(RX,RY) = A + 1:RX = RX + DX:RY
    = RY + DY: NEXT :LN(A) = LEN (W$
    ): NEXT
ED 1070 RETURN
93 1080 REM SHUFFLE WORDS
15 1090 FOR A = 1 TO NW / 2:B = RND (1) *
    NW:C = RND (1) * NW:T$ = W$(B):W
    $(B) = W$(C):W$(C) = T$
2D 1100 NEXT : RETURN
80 1110 REM READ IN WORDS
7E 1120 DIM W$(200):NW = - 1
95 1130 NW = NW + 1: READ W$: FOR A = 1 T
    O LEN (W$):W$(NW) = W$(NW) + CHR$
    ( ASC ( MID$ (W$,A,1)) - 1)
51 1140 NEXT : IF W$(NW) < > "END" THEN 1
    130
E7 1150 RETURN
A9 1160 FOR A = 0 TO 7: READ DX(A),DY(A):
    NEXT
E2 1170 FOR A = 0 TO 19: FOR B = 0 TO 14:
    AR$(A,B) = " ": NEXT B,A
F3 1180 RETURN
4A 1190 DATA 0,1,1,0,0,-1,-1,0,-1,1,1,1,
    -1,-1,-1
AF 1200 DATA DBSOJWBM,DJSDVT,DBOBEB,VOJUF
    E,UFMFQIPF,NPOLFZ,DPNQVUFS
1C 1210 DATA KPZTUJDL,NPOTUFS,NBHJDBM,TIV
    GGMF,FOE

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Backgammon

Jeffrey Vavasour and Geoff Rideout

Apple version by Tim Victor, Editorial Programmer

The classic game of backgammon combines equal parts of luck and strategy. This version observes all the regulations of standard backgammon. For the Apple II+, IIe, and IIfx. Works with both DOS 3.3 and ProDOS.

The computer's your opponent in this challenging game of backgammon. Using a decision-making algorithm, the computer plots its best moves while you develop your own winning strategy. The only thing missing is the doubling cube, sometimes used in gambling.

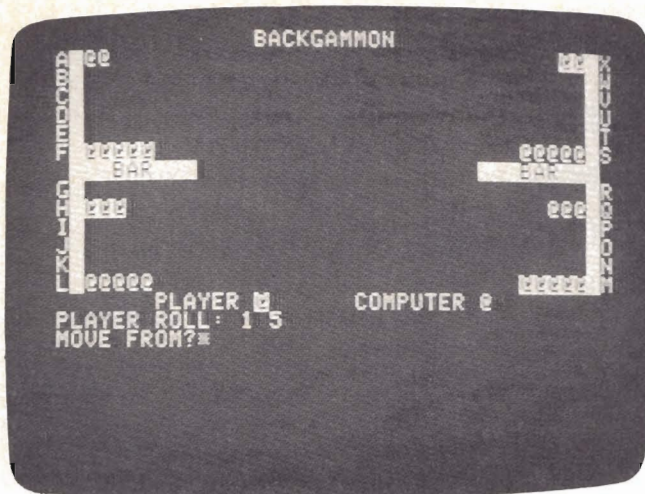
Type in and save "Backgammon" to disk. If you're playing on an Apple IIe or IIfx, be sure that the Caps Lock key is pressed down.

If you're already familiar with the rules of backgammon, you can skip over this next section.

The Rules Of Backgammon

The best way to learn backgammon is to have someone who plays teach you. If that's not possible, you can probably find books about backgammon at a local library. Here's a brief introduction to the basic rules:

- The playing board contains 24 points, divided into four groups of six, with a bar running down the middle. Players take turns moving their pieces around the board, and on the points. One player moves clockwise, the other counterclockwise. Your goal is to move all your pieces into the *inner table* and then start moving the pieces off the board. The inner tables of the two players are directly opposite each other. On the screen, you move clockwise from X to A toward your inner table in the upper-left corner (the positions labeled A-F). The computer moves counterclockwise toward positions S-X.
- When it's your turn, you (the computer, really) roll two dice. Say you get a 3 and a 5. You can move one piece three points and another five, or you can move a single piece five and then three, for a total of eight. Any piece can be moved from one position to another as long as the destination is not *blocked*. If your opponent has two or more pieces on a point, it's considered blocked and you can't move there.
- If there's a single piece there, you can *blot* it—your piece takes the position and your opponent's blotted piece is moved to the bar in the middle. When one or more of your pieces is on



The backgammon board at the beginning of the game shows the player's pieces highlighted. The first dice roll, 1 and 5, will force the player to leave one piece unprotected.

the bar, you can't make any moves on the main field until the piece moves off the bar back onto the board. You have to move it to one of the points in your opponent's inner table, based on the roll of the dice. In this game, for example, if you have a piece on the bar and roll a 1 and a 5, you could move off the bar to position X (to use the 1) or position T (5). Then, you'd use the other number to move a single piece.

- Rolling doubles gives you double the moves. So if you roll two 3s you get four moves of three points instead of two moves of three points.
- Once you've moved all your pieces to the inner table—the six points labeled A–F—you can start to *bear off*. Rolling a 2 and a 3 would allow you to remove one piece from B and one from C. The first player to remove all pieces from the board wins the game.

A lot of backgammon strategy is building safe positions, points containing two or more pieces. In general, you should not leave a single piece on a point where it can be blotted by the other player, although sometimes it's unavoidable. It also helps to have an understanding of the odds for rolling certain combinations with the dice.

Basic Game Play

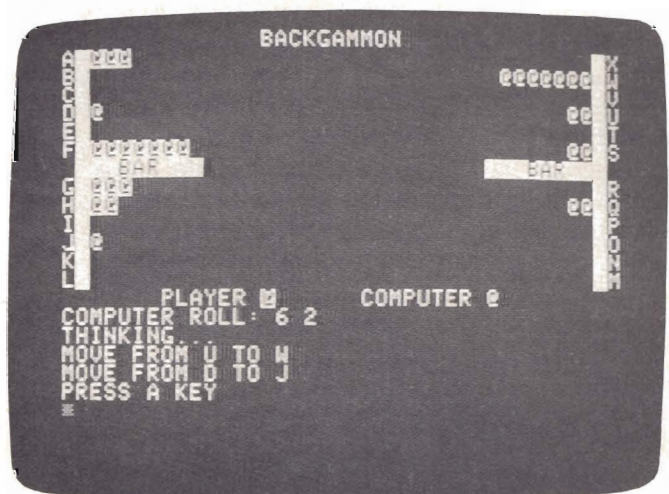
Throughout the game, a graphic representation of the backgammon board is displayed on the upper portion of the screen. Board positions consist of the letters A through X (representing the board locations, starting in the upper-left corner and running counterclockwise) and BAR. Board positions are printed next to their appropriate locations.

When you run the program, you're asked *WILL I GO FIRST?* If you want the computer to move first, respond with Y. Otherwise, press N. The computer draws the board and places the game pieces in the starting position (you start with five pieces in your inner table, two at the far end in the computer's inner table, and eight in between). The computer's pieces are not highlighted, and move counterclockwise from A to X. The highlighted pieces are yours. They move clockwise from X to A.

When it's your turn, the message *PLAYER ROLL* is displayed below the game board, followed by the result of the dice roll, based on a random throw. If you roll doubles, the number is printed four times to indicate that you have four moves. Below this you're presented with a *MOVE FROM?* prompt. Respond with the location you're moving from by typing the appropriate letter A through X. If the location you entered doesn't contain any highlighted pieces or is not within the range of the board, *ILLEGAL MOVE* is displayed below the prompt and the cursor returns to the beginning of your input. If you have any pieces on the bar, *MOVE FROM BAR* appears and the computer automatically skips to the *TO?* prompt.

After you've responded to the *FROM?* prompt, *TO?* appears. Answer this with a letter from A to X representing the destination on the board, or *OFF* indicating you wish to take the piece off the board. If your move is not permissible, *ILLEGAL MOVE* displays and the cursor returns to the *FROM?* prompt.

If you can't move, typing *NO* at either the



Late in the game, the computer rolls a 6 and 2, moving one piece from U to W, another from D to J. Unless the computer starts getting some doubles, it looks like the player will win.

FROM? or TO? prompt skips the rest of your turn and starts the computer's.

To move off the board, *all* your remaining pieces *must* be on positions A through F, in other words, in your inner table.

When it's the computer's turn to move, the input area below the board is cleared, and the computer's rolls are displayed in the same form as the player's.

While the computer is evaluating each of its moves, *THINKING...* is displayed. The message *MOVE FROM xxx TO yyy* follows after a few seconds, indicating the computer's decision.

Once the computer has exhausted all of its moves, after it has used all of the dice or when it can't move due to some block (in which case *CAN NOT MOVE* is displayed. This gives you a chance to look at the move made by the computer. Press any key to proceed to your turn.

When the game is over, the computer displays the winner and offers you a chance to play again.

How It All Works

The computer's strategy uses a process of evaluation and elimination. The program starts at the bar and scans the board through location X using each of the die rolls. It then records the highest evaluation number (described below), highest evaluated move, and roll. If there's no evaluation number (it's 0) or there are pieces on the bar and the evaluation is less than 128, the computer decides it can't move. You're told this and the computer's turn ends. Otherwise this process is repeated until all rolls are used.

A particular move is evaluated by adding up various values reflecting the advantage of such a move. The computer evaluates a move off the bar as 128 (being of most importance) and off the board as 64. Protection of two exposed pieces by moving one atop another has a value of 32. If the move doesn't expose any other pieces, either at the origin of the move or the destination, a value of 16 is added. If the opponent can be placed on the bar, the evaluation is 8. Movement on the outer table is counted as 4. Also, moves where another piece covers that being moved are given a value of 2. Legal moves are assigned a value of 1, a method to determine whether any legal moves were found at the end of the evaluation process.

Any of these values may be combined to form a general evaluation of the move. For instance, a move off the bar which places the other player *on* the bar is given a value of 136 (128 and 8). The table included in the sidebar contains a list of move values, a brief description, and the program line which contains each.

By changing these values, you can change the computer's strategy, increasing or decreasing the difficulty of play or just adding some variety to the computer's logic. If you want to

Variable Descriptions

Variable	Description
A\$	Used when waiting for a key at the end of the computer's turn.
B(x)	Board contents. B(0) is computer bar, B(1-24) represent board locations A through X, and B(25) is the number of pieces off the board. A positive number indicates computer pieces; a negative number indicates player.
E	Evaluation of current move being processed by the computer.
F\$	Input from player's FROM? prompt.
H	Highest evaluated move by computer.
HP	Computer's highest evaluated position (0-24) or player's FROM position (1-25).
HR	Computer's highest evaluated roll or how far player wishes to move.
LN	Die number (0-3) of lowest computer roll.
LR	Value of lowest computer roll, same as R(LN).
MF\$	Indicates current turn. If string starts with N, it is the player's turn; otherwise, it is the computer's turn.
OB	Nonzero indicates computer may move off board. Also contains the die number the player is using (HR usually equals R(OB)).
PB	Indicates the number of pieces the player has on bar (-2 means two pieces on bar).
PO	Indicates the number of pieces which the player has moved off bar.
R(x)	Contains the remaining rolls. Used die are indicated by a 0; x must be from 0 to 3.
FNR(x)	Returns a random number between 1 and 6.
T\$	Input of player's TO? prompt.
X,Y,Z	Miscellaneous counters and pointers.
XS,Z\$	Computer's FROM and TO respectively.

Computer Evaluation Ranking

Rank	Description	Line Number
128	Move computer piece off bar.	350
64	Move computer piece off board.	360
32	Move an exposed piece to a position also containing an exposed computer piece.	370
16	A move which does not expose any pieces.	380
8	A move which places the player on bar.	390
4	A move that is not in the computer's inner table.	400
2	A move in which the piece will be covered by another piece in the same turn.	450
1	A legal move.	420

change a value, simply replace the number following the statement $E=E+x$ in the appropriate line. When doing this, it's best to leave moves off the bar unchanged because a value less than 128 will prevent the computer from being able to move off the bar.

If you're a backgammon expert, you may find that you can beat the computer most of the time. In playing, we tend to take calculated risks which may eventually pay off. We can also look one or two moves ahead, something the computer can't do. The computer's process of evaluating every possible move makes it avoid risks—if at all possible—which results in a fairly conservative game.

Backgammon

Be sure to use "Apple Automatic Proofreader," found elsewhere in this issue, to enter the following program.

```

90 100 VTAB 7: HTAB 14: PRINT "BACKGAMMON
"
02 110 HOME : INPUT "WILL I GO FIRST? ";M
F$
3A 120 DIM B(25),R(3): DEF FN R(X) = INT
( RND (X) * 6) + 1
EE 130 FOR X = 1 TO 24: READ B(X): NEXT X
F8 140 DATA 2,0,0,0,0,-5,0,-3,0,0,0,5,-5,
0,0,0,3,0,5,0,0,0,0,-2
26 150 HOME : HTAB 15: PRINT "BACKGAMMON"
: FOR X = 1 TO 12
AA 160 PRINT CHR$(64 + X);: INVERSE : PR
INT " ";: HTAB 39: PRINT " ";: NOR
MAL : PRINT CHR$(89 - X);
DA 170 IF X = 6 THEN HTAB 2: INVERSE : PR
INT " BAR ";: HTAB 31: PRINT "
BAR ": NORMAL
09 180 NEXT
0A 190 VTAB 15: HTAB 8: PRINT "PLAYER ";:
INVERSE : PRINT "a";: NORMAL
A5 200 HTAB 22: PRINT "COMPUTER a"
5B 210 FOR X = 1 TO 24: IF B(X) = 0 THEN
250
BB 220 Z = ABS (B(X)): FOR Y = 1 TO Z
57 230 GOSUB 1150: IF B(X) < 0 THEN INVER
SE
47 240 PRINT "a": NORMAL : NEXT Y
70 250 NEXT X
EA 260 GOSUB 1080
DC 270 IF LEFT$(MF$,1) = "N" THEN 750
6A 280 PRINT "COMPUTER ";: GOSUB 1120
1A 290 VTAB VP: PRINT "THINKING...":VP =
VP + 1
0B 300 OB = 0: FOR Z = 0 TO 18: IF B(Z) >
0 THEN 320
0B 310 NEXT Z:OB = 1
E0 320 H = 0:HP = 0:HR = 0: FOR Y = 0 TO
3:X = 0: IF R(Y) = 0 THEN 490
F0 330 E = 0
6D 340 IF B(X) < 1 OR R(Y) + X > 25 THEN
480
0A 350 IF X = 0 AND B(X) > 0 THEN E = E +
128
0C 360 IF X + R(Y) = 25 THEN E = E + 64
73 370 IF B(X) = 1 AND B(X + R(Y)) = 1 TH
EN E = E + 32
4C 380 IF B(X) < > 2 AND B(X + R(Y)) > 0

```

```

THEN E = E + 16
2E 390 IF B(X + R(Y)) = - 1 THEN E = E +
8
78 400 IF X < 19 THEN E = E + 4
2F 410 IF B(X + R(Y)) < - 1 OR (OB = 0 AN
D (X + R(Y)) = 25) THEN 480
43 420 E = E + 1: IF Y = 3 OR X + R(Y) =
25 OR B(X + R(Y)) > 0 THEN 470
90 430 Z = Y + 1
34 440 QA = 0: IF R(Z) > 0 AND X + R(Y) -
R(Z) > - 1 AND X + R(Y) - R(Z) <
25 THEN QA = 1
3A 450 IF QA = 1 THEN IF B(X + R(Y) - R(Z
)) > 0 THEN E = E + 2: GOTO 470
09 460 Z = Z + 1: IF Z < 4 THEN 440
85 470 IF H < E THEN H = E:HR = R(Y):HP =
X
13 480 X = X + 1: IF X < 25 THEN 330
FA 490 NEXT Y
FD 500 IF H < 128 AND B(0) > 0 THEN 590
99 510 IF H > 0 THEN 620
B7 520 LR = 7: FOR Y = 0 TO 3
97 530 IF R(Y) < LR AND R(Y) > 1 THEN LR
= R(Y):LN = Y
ED 540 NEXT Y: IF LR = 7 THEN 590
68 550 FOR X = 0 TO 25 - LR: IF B(X) > 0
THEN 590
2C 560 NEXT X:X = 26 - LR
EE 570 IF B(X) > 0 THEN R(LN) = 25 - X: G
OTO 300
64 580 X = X + 1: IF X < 25 THEN 570
41 590 VTAB VP: HTAB 2: INVERSE : PRINT "
CAN NOT MOVE - PRESS A KEY": NORMA
L :MF$ = "N"
E7 600 GET A$: IF A$ = "" THEN 600
18 610 GOTO 260
E2 620 FOR X = 0 TO 3: IF R(X) < > HR THE
N NEXT X
17 630 R(X) = 0
50 640 IF B(HP) < 11 AND HP > 0 THEN Y =
B(HP):X = HP: GOSUB 1150: PRINT "
"
65 650 IF HP = 0 AND B(0) < 8 THEN VTAB 8
: HTAB 31 - B(0): PRINT " "
5D 660 B(HP) = B(HP) - 1:Z$ = CHR$(HP +
HR + 64): IF HP + HR > 24 THEN Z$
= "OFF"
FE 670 X$ = CHR$(HP + 64): IF HP = 0 THE
N X$ = "BAR"
C1 680 VTAB VP: PRINT "MOVE FROM ";X$;" T
O ";Z$:VP = VP + 1
83 690 IF B(HP + HR) = - 1 THEN PB = PB -
1:B(HP + HR) = 0: IF PB > - 7 THE
N VTAB 8: HTAB 10 - PB: INVERSE :
PRINT "a": NORMAL
05 700 Y = B(HP + HR) + 1:B(HP + HR) = Y
DE 710 IF HP + HR < 25 AND Y < 11 THEN X
= HP + HR: GOSUB 1150: PRINT "a":
GOTO 730
91 720 IF B(25) = 15 THEN GOSUB 1080: PRI
NT "I WIN.": GOTO 1100
EB 730 FOR X = 0 TO 3: IF R(X) > 0 THEN 3
00
85 740 NEXT X: VTAB VP: PRINT "PRESS A KE
Y":MF$ = "N": GOTO 600
FC 750 PRINT "PLAYER ";: GOSUB 1120
71 760 F$ = "a": VTAB VP:VP = VP + 1: PRI
NT "MOVE FROM": IF PB < 0 THEN PR
INT " BAR":HP = 25:F$ = "Y": GOTO
810
68 770 INPUT F$:F$ = LEFT$(F$,2): IF F$
= "NO" THEN MF$ = "": GOTO 260

```



```

00 780 IF F$ = "DR" THEN RUN
01 790 IF F$ < "A" OR F$ > "X" THEN 1070
74 800 HP = ASC (F$) - 64: IF B(HP) >= 0
    THEN 1070
80 810 VTAB VP - 1: HTAB 18: T$ = "Q": PRI
    NT "TO";: INPUT T$: IF T$ = "" THE
    N T$ = "OFF"
50 820 HR = ASC (F$) - ASC (T$): IF HR =
    0 THEN 1070
00 830 IF T$ = "NO" THEN MF$ = "": GOTO 2
    60
16 840 IF T$ = "DRAW" THEN 150
2A 850 X = 0: IF T$ = "OFF" THEN HR = HP:
    GOTO 880
51 860 FOR X = 0 TO 3: IF HR < > R(X) THE
    N NEXT X: GOTO 1070
98 870 OB = X: GOTO 950
98 880 MR = 7: FOR X = 0 TO 3: IF R(X) =
    HP OR R(X) > HP AND R(X) < MR THEN
    MR = R(X): OB = X
6E 890 IF R(X) < > HP THEN NEXT X
74 900 IF MR = 7 THEN 1070
C2 910 IF MR = HP THEN Z = 7: GOTO 930
69 920 Z = HP + 1
09 930 FOR X = Z TO 24: IF B(X) < 0 THEN
    1070
75 940 NEXT X
0B 950 IF B(HP - HR) > 1 AND HP < > HR TH
    EN 1070
27 960 IF B(HP - HR) > 0 AND HP < > HR TH
    EN B(HP - HR) = 0: B(0) = B(0) + 1:
    IF B(0) < 7 THEN VTAB 8: HTAB 31
    - B(0): PRINT "Q"
26 970 IF HP = 25 AND PB > - 7 THEN VTAB
    8: HTAB 10 - PB: PRINT " ": PB = PB
    + 1
8D 980 IF HP < 25 THEN Y = - B(HP): B(HP)
    = B(HP) + 1: IF Y < 11 THEN X = HP
    : GOSUB 1150: PRINT " "
EE 990 IF HP = HR THEN 1030
87 1000 B(HP - HR) = B(HP - HR) - 1: Y = -
    B(HP - HR)
F1 1010 IF Y < 11 THEN X = HP - HR: GOSUB
    1150: INVERSE: PRINT "Q": NORMA
    L
66 1020 GOTO 1050
34 1030 PO = PO + 1
29 1040 IF PO = 15 THEN GOSUB 1080: PRINT
    "YOU WIN.": GOTO 1100
19 1050 R(OB) = 0: FOR X = 0 TO 3: IF R(X
    ) > 0 THEN 760
FA 1060 NEXT X: MF$ = "": GOTO 260
CE 1070 VTAB VP: PRINT "ILLEGAL MOVE": VP
    = VP - 1: GOTO 760
6D 1080 FOR X = 16 TO 24: VTAB X: HTAB 1:
    PRINT SPC( 39): NEXT
C6 1090 VTAB 16: HTAB 1: VP = 17: RETURN
3F 1100 INPUT "PLAY AGAIN? (Y/N) ": A$: A$ =
    LEFT$ (A$, 1): IF A$ = "Y" OR A$
    = "y" THEN RUN
0B 1110 END
A5 1120 PRINT "ROLL.": R(0) = FN R(X): R(1
    ) = FN R(X): R(2) = 0: R(3) = 0: IF
    R(0) = R(1) THEN R(2) = R(0): R(3
    ) = R(0)
88 1130 FOR X = 0 TO 3: IF R(X) > 0 THEN
    PRINT " " R(X);
4C 1140 NEXT X: PRINT: RETURN
C1 1150 IF X > 12 THEN 1170
63 1160 VTAB X + (X > 6) + 1: HTAB Y + 2:
    RETURN
52 1170 VTAB 26 + (X < 19) - X: HTAB 39 -
    Y: RETURN

```

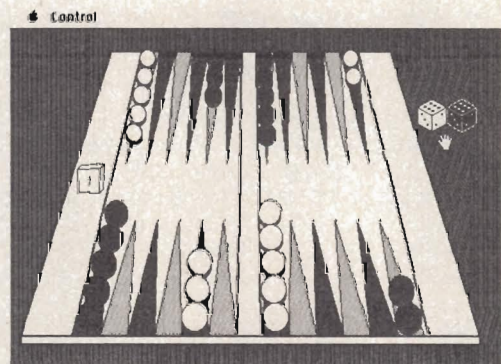
Backgammon On The Macintosh

There's no Macintosh version of Backgammon included in this issue, but you can find backgammon, an excellent version at that, on MAUG (Micronetworked Apple Users Group), one of the special interest forums on CompuServe, the commercial online service.

This version of backgammon for the Macintosh is *shareware*, which means that its author, Stephen Young, has made the game available on a trial basis. Like all shareware, if you enjoy the game enough to use it, you're asked to send a fee to the author (in this case, the fee is up to you—whatever you think the game is worth).

Played on a three-dimensional board, Backgammon is a one-player game that's simple to operate, though beating your computer opponent is another matter. You play the white pieces, the Macintosh plays the black. All standard rules of backgammon apply in this version, which even offers a doubling cube. (See the previous article, "Backgammon," for a short explanation of the basic rules if you're unfamiliar with the game.)

Using the mouse pointer, redesigned to look like a hand, you roll the die for both yourself and the computer. Moving pieces is as easy as clicking and dragging. You'll hear a *beep* should you try to make an illegal move.



Clicking the pointer on the die starts Backgammon.

You can find Backgammon for the Macintosh on the MAUG Macintosh User Forum's Data Library 4, listed as the file BACKGA.HCX. To download Backgammon, you must be a subscriber to CompuServe and a member of MAUG (sign up for MAUG by typing GO MACUS at any ! prompt, then select new member information). You'll also need a modem, a terminal program (preferably one that supports MacBinary format), and BinHex 5.0, a conversion utility to translate Backgammon into an application you can run. BinHex 5.0 is available on the Macintosh User Forum's Data Library 0.

Apple Automatic Proofreader

Tim Victor, Editorial Programmer

It's easier than ever to enjoy programs for Apple II-series computers. "Apple Automatic Proofreader," an error-checking program for the Apple II, II+, IIe, and IIC, with either DOS 3.3 or ProDOS, alerts you to almost every typing mistake you might make.

"Apple Automatic Proofreader" will help you type in program listings without typing mistakes. It's a short error-checking program that hides itself in memory and attaches to your Apple's operating system. Each time you press Return to enter a program line, this routine displays a two-digit checksum at the top of your screen. If you've typed the line correctly, the checksum on your screen matches the one in the printed listing—it's that simple. You don't have to use the Proofreader to enter listings, but doing so greatly reduces your chance of making a typo.

Getting Started

First, type in the Apple Automatic Proofreader program following this article. The Proofreader can't check itself before it's done, so you'll have to be extra careful to avoid mistakes.

The Proofreader checks which operating system you're running before it hooks up the checksum routine, so you can type it in with either DOS 3.3 or ProDOS. If you want to use the Proofreader with both operating systems, you won't have to retype it. All you need is a utility to copy a file between disks with different formats, such as the one provided on the ProDOS User's or System Utilities disk.

As soon as you finish typing the Proofreader, save at least two copies. This is very important, because the Proofreader erases the

BASIC portion of itself when you run it, leaving only the machine language portion in memory.

Now, type RUN and hit Return. The Proofreader clears the screen, loads the machine language routine, displays the message PROOF-READER ACTIVATED, erases the BASIC portion of itself, and erases. If you type LIST and press Return, you'll see that no BASIC program is in memory. The computer is ready for you to type in a new BASIC program.

Entering Programs

Once the Proofreader is activated, you can begin typing in a BASIC program as usual. Every time you finish typing a line and press Return, the Proofreader displays a two-digit checksum number in the upper-left corner of the screen. Compare this checksum with the two-digit checksum printed next to the corresponding line in the program listing. If the numbers match, you can be pretty certain the line was typed correctly. Otherwise, check for your mistake and type the line again.

A common mistake when entering BASIC programs on the Apple occurs when you accidentally press a key while holding down the Control key. This adds an invisible control character to the line you are typing. If you don't find it before you run the program, this stray character may cause a SYNTAX ERROR or other mysterious behavior. Fortunately, the Proofreader detects the presence of these invisible control characters and displays a checksum that doesn't match the one in the listing. So it's always a good idea to retype a line if the checksums don't match, even though you might not see any difference in the lines themselves.

The Proofreader ignores space characters, so you can omit spaces between keywords and still see a matching checksum. Spaces are important only between the quotation marks of PRINT statements or string assignments. The only mistake the Proofreader won't catch is if you accidentally type too many spaces or leave some out. For this reason, be extra careful when you're entering text within quotes.

Before running another BASIC program, it's a good idea to turn off the Proofreader by holding down the Control key while pressing the Reset button. The machine language part of the Proofreader is kept in memory starting at address 768 (\$300 hexadecimal). This location is out of BASIC's way, but a lot of other programs use this same place for their machine language subroutines. Disable the Proofreader to avoid conflicts.

How It Works

When the Applesoft BASIC interpreter needs to get a line of input from the keyboard, it calls a machine language routine in the Apple's read-only memory (ROM) called GETLN. GETLN, in turn, calls the operating system to get a single keypress, which it stores in an input buffer. If the Return key was pressed, GETLN ends, leaving one new line for the BASIC interpreter in the input buffer. Otherwise, it repeats the process, asking for another keypress.

The operating system normally gets individual keystrokes from a ROM routine called KEYIN, but the Proofreader changes this. When the Proofreader is installed, the operating system calls the checksum routine instead, and the checksum routine asks KEYIN for a character. If any key other than Return was pressed, the checksum routine just passes it on to the operating system, which gives it to GETLN. But if Return *was* pressed, the checksum routine examines the contents of GETLN's input buffer, which now contains an entire line of input, to calculate the checksum that it displays at the top of the screen.

A common typing mistake is transposition—typing two successive characters in the wrong order, like *PIRNT* instead of *PRINT*. A checksum program that merely adds the codes of the characters in a line can detect only the presence or absence of a character, not transposition errors. Because the Apple Proofreader uses a sophisticated formula to compute checksums, it alerts you to transposed keystrokes.

The Apple Automatic Proofreader detects almost every possible typing mistake, including

transpositions, missing or extra characters, accidental control characters, and incorrect line numbers. Typing *COMPUTE's Apple Applications Special* programs into your Apple computer has never been easier.

Apple Automatic Proofreader

```

10 C = 0: FOR I = 768 TO 768 + 68: READ A: C = C + A: POKE I, A: NEXT I
20 IF C < > 7258 THEN PRINT "ERROR IN PROOFREADER DATA STATEMENTS": END
30 IF PEEK (190 * 256) < > 76 THEN POKE 56, 0: POKE 57, 3: CALL 1002: GOTO 50
40 PRINT CHR$ (4); "IN#A$300"
50 POKE 34, 0: HOME: POKE 34, 1: VTAB 2: PRINT "PROOFREADER INSTALLED"
60 NEW
100 DATA 216, 32, 27, 253, 201, 141
110 DATA 208, 60, 138, 72, 169, 0
120 DATA 72, 189, 255, 1, 201, 160
130 DATA 240, 8, 104, 10, 125, 255
140 DATA 1, 105, 0, 72, 202, 208
150 DATA 238, 104, 170, 41, 15, 9
160 DATA 48, 201, 58, 144, 2, 233
170 DATA 57, 141, 1, 4, 138, 74
180 DATA 74, 74, 74, 41, 15, 9
190 DATA 48, 201, 58, 144, 2, 233
200 DATA 57, 141, 0, 4, 104, 170
210 DATA 169, 141, 96

```

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Apple Disk

All Apple II programs in this issue are available on the companion *Apple Applications Disk*. Formatted for both DOS 3.3 and ProDOS, the *Disk* costs \$12.95, plus \$2.00 shipping and handling, and can be purchased only through **COMPUTE!** Publications. See page 33 for details.

New Products

Apple II Touch Screen

Personal Touch Corporation has introduced its Touch Window, a touch screen input device that mounts directly on a monitor, for the Apple II series of computers.

Included with Touch Window is *Master Touch I*, a disk containing six touch screen applications; *TouchWriter I*, a simple word processor; *TouchGraphics*, a graphics creator; *Expense Account Manager*, an everyday spreadsheet application; *Bishop's Square*, a puzzle game; *Touch Checkers*, a touch screen version of the popular board game; and *Window Test*, a recalibration and test program for the Touch Window.

Also included in the package is *Interactive Book I*, an illustrated book (for ages three to adult) with pages specially designed to work with the Touch Window. The user interacts with the book by touching a page, and the program responds with sounds, animation, calculations, clues, scores, or instructions, depending on the particular application.

Touch Window can also be removed for use as a graphics tablet, input pad, or interactive book pad. Suggested retail price for Touch Window, the software, and the interactive book is \$199.95. Touch Window-compatible software programs are also available from a variety of companies, including Sunburst, Brøderbund, Mindscape, and Springboard.

Personal Touch Corporation, 4320 Stevens Creek Blvd., San Jose, CA 95129.

Circle Reader Service Number 150.

10 And 20 Megabyte Mac Hard Drives

Micah, Inc., has introduced its MicahDrive 10 AT and MicahDrive 20 AT internal hard disk drives for the Macintosh 512K and Macintosh Plus computers.

Including a high-speed proprietary internal interface and built-in fan and power supply, the drives transfer data to and from RAM memory at full disk speed of .625 megabytes per second while leaving the computer's external ports free for other devices.

The MicahDrive ATs are user-installable by simply clipping onto the Macintosh main logic board; installation reportedly requires no technical knowledge and does not void the Apple warranty. The drives use the new Hierarchical Filing System (HFS) with Finder 5.1, both licensed from Apple Computer and bundled with the hard drives.

The MicahDrive 10 AT is priced at \$1,495, and the MicahDrive 20 AT at \$1,895. Optional built-in 2- and 4-megabyte MicahMemory 2/4 memory expansion boards for the Macintosh Plus, priced at \$595 and \$895 respectively, are also available.

Micah, Inc., 15 Princess Street, Sausalito, CA 94965.

Circle Reader Service Number 151.



The MicahDrive AT internal hard disk drive for the Macintosh 512 and Macintosh Plus.

CD-ROM For Apple II

A CD-ROM (Compact Disc-Read Only Memory) player with Apple IIe controller card is being distributed by Microtrends. The unit, which will be marketed to schools and libraries, has

a suggested retail price of \$1,995, and will use *Grolier's Electronic Encyclopedia* as well as other CD-ROM database packages in the future.

The CD-ROM drive is Philips' CM 100, which will operate with Microtrends' controller card in an Apple IIe. The drive provides access to up to 600 megabytes of digital data on standard 120mm compact discs.

Microtrends, 650 Woodfield Drive, Suite 730, Schaumburg, IL 60195.

Circle Reader Service Number 152.

AppleWorks-Compatible Report Writer

Megahaus Corporation has announced *ReportWorks*, a report writing program for use with the *AppleWorks* productivity package, which is also compatible with the company's earlier release, *MegaWorks*, a mail merge and spelling checker for use with the Apple II.

In addition, *ReportWorks* supports Apple's new Apple II Memory Expansion Card and UniDisk 3.5 disk drive.

With *ReportWorks*, users are able to import data from *AppleWorks* database and spreadsheet files to create reports, tables, lists, and full-page forms. *ReportWorks* also enhances *AppleWorks* reporting features by adding math, file lookup, and sorting capabilities. The program uses the same commands and file formats as *MegaWorks*, similar to *AppleWorks*.

Suggested retail price for *ReportWorks* is \$125.

Megahaus Corporation, 5703 Oberlin Drive, San Diego, CA 92121.

Circle Reader Service Number 153.

Mac-Tracks And Work-n-Print

Two new time-saving desk accessories for the Macintosh have been released from Assimilation, Inc. *Mac-Tracks* is a macro-command program that can store up to 5,000 characters on a single key, and works with all Macintosh software. Menu selections, mouse movements, graphics, and keystrokes can be stored.

Work-n-Print is a program which enables you to print out any file while you're still at work on the Mac. The program also lets you print as many

New Products

documents as you want, consecutively, without stopping in between. Each program lists for \$29.

Assimilation, Inc., 20833 Stevens Creek Blvd., Suite 101, Cupertino, CA 95014.

Circle Reader Service Number 154.

Apple II Chess Tutor

Paul Whitehead Teaches Chess, from Enlightenment, Inc., is a chess tutorial program for beginners as well as middle-level players using the Apple II (minimum of 64K) computers.

Developed by Paul Whitehead, former U.S. Junior and American Open chess champion, the program offers more than 40 hours of interactive chess instruction as well as the *Coffeehouse Chess Monster*, a chess-opponent program that allows you to play out any position found in the tutorial or play new games against a human opponent or the computer. The price is \$49.95.

Enlightenment, Inc., 1240 Sanchez Street, San Francisco, CA 94114.

Circle Reader Service Number 155.

External RAM Disk

Quickdrive, from MacVentures, is an easy-to-install external RAM disk device that functions as an ultra-fast electronic disk drive for the Macintosh. Not additional system memory, the Quickdrive is used as any other disk drive. The Quickdrive can be partitioned into as many as four "drives" (each which appear on the screen as a separate disk icon). Part of the Quickdrive's RAM can be set aside as a printer buffer to allow other tasks to continue while printing takes place.

Applications and documents are copied into the Quickdrive with the standard file transfer method of clicking and dragging from the desktop. Once files are loaded to the Quickdrive, program launch and file opens and saves take just a fraction of the time of similar operations using floppy disks.

Like an internal, software-created RAM disk, the data held in the Quickdrive is lost when the power is disconnected. However, the unit

comes with its own power supply, letting you switch off the Macintosh, yet leaving the Quickdrive turned on. This also protects data from any computer system crashes.

Suggested retail prices for the Quickdrive units are: 512K RAM, \$499; 1 megabyte RAM, \$649; 1.5 megabytes RAM, \$799; and 2 megabytes RAM, \$949. Memory upgrades cost \$169 for each 512K of RAM.

MacVentures, P.O. Box 6123, Aloha, OR 97007.

Circle Reader Service Number 156.

Apple IIc System Clock

Applied Engineering has released an AppleWorks-compatible system clock for the Apple IIc. The clock, along with the *ClockWorks* software, displays the date and time in the lower right hand corner of the AppleWorks display. It also stamps AppleWorks files with the time they are saved, and can be automatically accessed from any AppleWorks database category.

The clock uses three AA batteries, and plugs into the serial port between the IIc and other serial devices, such as a printer or modem. It is fully ProDos compatible, and includes the year, month, date, day of week, hour, minute, and second. Suggested retail price, \$79.

Applied Engineering, P.O. Box 798, Carrollton, TX 75006.

Circle Reader Service Number 157.

Wizardry On The Mac

Sir-Tech is now offering the first scenario in its popular *Wizardry* fantasy role-playing game series for the Macintosh. Titled *Proving Grounds of the Mad Overlord*, this version uses icons, pop-down windows, and other Macintosh features. The *Wizardry* series has been one of the most successful adventure games in the Apple II line of entertainment software.

The Macintosh version of *Proving Grounds of the Mad Overlord* is priced at \$59.95.

The Apple II scenarios include *Overlord* (\$49.95), *Knight of Diamonds* (\$34.95), *Legacy of Llylgamyn* (\$39.95), and *The Return of Werdna* (\$44.95).

Sir-Tech Software, Inc., 6 Main Street, Ogdensburg, NY 13669.

Circle Reader Service Number 158.

King's Quest Sequel

King Graham embarks on another magical quest in *King's Quest II: Romancing the Throne* from Sierra. Searching for the magic keys that will lead him to his fair maiden, he explores underground caverns, eerie towers, and ocean wonderlands. As in the original *King's Quest*, magical and mystical beasts abound. Three-dimensional animated graphics are featured. Several solutions are available for each of the game's puzzles, to allow for greater variety of play.

King's Quest II is available for the Apple IIe and IIc with at least 128K for a list price of \$49.95.

Sierra On-Line, Inc., Coarsegold, CA 93614.

Circle Reader Service Number 159.

Interfaces For Apple II

Street Electronics has developed four new products for the Apple II series. The BusinessCard is fully compatible with the ImageWriter II printer, and includes two serial interfaces, a clock/calendar with battery backup, and over 60 built-in commands for printer, clock, and modem applications. Suggested retail price for the BusinessCard is \$219.95, including printer cable. The optional 16K Buffer Kit lists for \$39.95; the 64K Kit for \$79.95.

The AlphaBits II serial printer/communication interface, like the BusinessCard, supports the ImageWriter II and the Apple Personal Modem, but has only one serial port. Suggested retail price, \$119.95.

Also new from Street Electronics is the LiveWire, an intelligent converter cable with a built-in clock that connects a parallel printer to the serial port on the Apple IIc. It also has a clock/calendar and battery backup. Suggested retail price, \$99.95.

EchoWords 3.5 offers 4,000 new spoken words to those who own an Apple IIe and the Echo+ speech synthesizer or an Apple IIc and the

Cricket speech synthesizer. The spoken words can be added to any BASIC program. Suggested retail price, \$49.95.

Street Electronics Corporation, 1140 Mark Avenue, Carpinteria, CA 93013.
Circle Reader Service Number 160.

Beach-Head And Beach-Head II

Access Software's popular *Beach-Head* action game is now available for the Apple II family with 48K memory. The player is led through torpedo-infested waters, a full-scale air assault, a sea battle, and a land invasion through an obstacle-ridden stretch of beach. The final conflict is at the fortress of Khun Lin, where the player must eliminate the ten gun turrets of the citadel. For one or two players. Suggested retail price, \$34.95.

Beach-Head II, subtitled "The Dictator Strikes Back," has also been released for the Apple from Access. This sequel to *Beach-Head* features animation and scrolling playcreens. Suggested retail price, \$34.95.

Access Software, 2561 South 1560 West, Woods Cross, UT 84087.



Circle Reader Service Number 161.

HabaCalc Spreadsheet

Haba Systems has released *HabaCalc*, a mouse/menu-driven spreadsheet for the Apple IIc. The 64-column, 256-row spreadsheet features easy to use pull-down menus and editing commands. High-resolution bar and pie graphs can be generated automatically from the program. Specialized mathematical functions include averages and square roots.

HabaCalc lists for \$74.95.

Haba Systems, 6711 Valjean Avenue, Van Nuys, CA 91406.

Circle Reader Service Number 162.

Color Printing

Colorful T-shirts, greeting cards, bumper stickers, and stationery are among the designs which can be created with *Prince*, a multi-color printing package for Apple computers with black-and-white printers. The package, which consists of the *Prince* software and four color ribbons, can capture any standard or double hi-res picture for editing and printing. Also included is the Craft Kit, for creating iron-on transfers, personalized disk labels, or bumper stickers. Suggested retail price, \$69.95.

Baudville, 1001 Medical Park Drive SE, Grand Rapids, MI 49506.

Circle Reader Service Number 163.

HyperDrive 2000

A new coprocessor board and internal Winchester disk drive for the Macintosh has been released from General Computer. Called HyperDrive 2000, this enhanced version of the HyperDrive-20 includes a 20-megabyte hard disk drive, a 12MHz 68000 microprocessor, a 68881 floating point coprocessor, and 1.5 megabytes of on-board RAM.

Also included are the five utilities that are available with the previous HyperDrive versions: *Manager*, which allocates memory and disk storage; *Backup*, which copies data from the hard disk to floppies; *Security*, which provides file encryption and password protection; *Print Spooler*, which allows you to continue using the Macintosh while it simultaneously drives a printer; and *HyperInstall*, which is used for installing or updating the system software. Suggested retail price, \$3,195.

General Computer Corp., 215 First Street, Cambridge, MA 02142.

Circle Reader Service Number 164.

AppleWorks Accessory

A package of five accessories for the Apple IIc and IIe called *Jeeves* has been released from PBI Software. Included

are an appointment calendar, a phone dialer with directory, a four-function calculator, a memo pad, and a software alarm clock. These can be accessed with one keystroke, which suspends the *AppleWorks* program in use. *Jeeves* sells for \$49.95.

PBI Software, 1155B-H Chess Drive, Foster City, CA 94404.

Circle Reader Service Number 165.

Educational Package For Apple II

With *LogoWriter*, a new educational software package from Logo Computer Systems, Inc., children can learn and practice word processing, programming, drawing, and making music. Developed by M.I.T. mathematics professor Seymour Papert, the program lets students combine the different parts of the package, for instance add illustration to text. Students can also reprogram parts of the package to suit their needs.

Logo Computer Systems is offering a site licensing agreement that will allow schools to copy as many disks as they need for a licensing fee of \$395. An additional \$150 buys the right to allow the whole student body to use copies at home.

Logo Computer Systems, Inc., 555 West 57th Street, Suite 1236, New York, NY 10019.

Circle Reader Service Number 166.

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Apple User Groups

COMPUTE!'s Apple Applications Special is pleased to publish the following list of Apple user groups, compiled and provided by Apple Computer, Inc. Though every effort has been made to insure that the information in this listing is current and complete, it was provided at a time when many changes were occurring in user group information. Apple wishes to extend its apologies for any errors which may appear. Please send any corrections, additions, or deletions to Ellen Petry Leanse, Apple User Group Evangelist, Apple Computer, Inc., 20525 Mariani Avenue, Mail Stop 23G, Cupertino, CA 95014. An updated listing may appear in future issues of COMPUTE!'s Apple Applications Special.

Apple Supporting User Groups

Apple Computer recently established a user group support program, directed by Ellen Petry Leanse, in order to promote better communications between Apple and the approximately 600 Apple user groups—more than 200,000 members—nationwide.

"User groups have supported Apple since its inception," said Leanse. "Research shows that knowledge of Apple products spreads faster by word-of-mouth than by any other means. User group members are the greatest



Courtesy of Apple Computer, Inc.

Ellen Petry Leanse, Apple's recently appointed User Group Evangelist, is the director of the company's user group support program.

proponents of Apple's products. They disseminate information and offer support on our products to users from all backgrounds and with different levels of experience. We're pleased to officially recognize them as a key resource. In nurturing our relationship with them, we're building a system that benefits user groups, our dealer base, Apple, and, of course, our customers."

The support program is expected to result in the formation of an Apple User Group Advisory Council, as well as a greater exchange of information among user groups, Apple dealers, and Apple itself.

For more information, contact Ellen Petry Leanse, Apple User

Group Evangelist, Apple Computer, Inc., 20525 Mariani Avenue, Mail Stop 23G, Cupertino, CA 95014.

The following user group listing is organized by state. Within each state, groups are listed by ZIP code.

ALABAMA

Apple Corps Of Birmingham
1037 F Huffman Rd
Birmingham
AL 35215

Forest Resources Systems Inst
Courtview Towers #24
201 N. Pine St
Florence
AL 35630

Quad Cities Apple Byters
129 E. Oak Hill Dr
Florence
AL 35630

Newton's Tree Apple User Group
3714 Lakewood Circle
Huntsville
AL 35811

Apple MUG
P.O. Box 20241
Montgomery
AL 36116

Peanuts & Apples
Rt. 2
Box 50
Ozark
AL 36350

Peanuts And Apples
Rt. 2
Box 50
Ozark
AL 36360

Sample
P.O. Box 8894
Mobile
AL 36689

ALASKA

The Alaskan Apple
P.O. Box 110753
Anchorage
AK 99511

Anchorage Apple Users Group
P.O. Box 110753
Anchorage
AK 99511

The Anchorage Mac User Group
1200 Diamond Street #812
Anchorage
AK 99515

Nome Public Schools
P.O. Box 131
Nome
AK 99762

ARIZONA

Adam-II
3035 E Topaz Circle
Phoenix
AZ 85028

Macexplorers-Phoenix
C/O APSCO
P.O. Box 21666 M/S 6079
Phoenix
AZ 85036

Mesa Mac Group
Mesa Computer Mart
1153 E Main St
Mesa
AZ 85203

Gilbert Apple Seeds
33 W Palo Verde St
Gilbert
AZ 85234

Gila Valley Apple Growers Association
P.O. Box 809
Thatcher
AZ 85552

Mountain View Apple Users
1932 Viola Dr
Sierra Vista
AZ 85635

Tucson Apple Core
3629 N Cavallero Place
Tucson
AZ 85705

Tucson Apple Users Group
Pima College
2202 W Anklam Rd
Tucson
AZ 85709

Apple C.A.R.T.
P.O. Box 2361
Page
AZ 86040

ARKANSAS

Apple Access
1855 North West Ave
El Dorado
AR 71730

Little Rock Apple Addicts
P.O. Box 55215
Hillcrest Station
Little Rock
AR 72205

Fayetteville Macintosh
2313 Holly
Fayetteville
AR 72703

Appleblossom
301 Mt. Vista Ave
Van Buren
AR 72956

CALIFORNIA

Ventura County Macintosh Club
1413 South Victoria Ave
Ventura
CA 93003

Macintosh Users Group
UCLA Graduate School of Education
Los Angeles
CA 90024

Los Angeles Macintosh Users Group
12021 Wilshire Blvd
#405
Los Angeles
CA 90025

LA Macintosh Group
4026 Garden Ave
Los Angeles
CA 90039

LA Apple Users Group
9513 Hindry Pl
Los Angeles
CA 90045

Lisa Club Of LA
854 N Croft Ave
Los Angeles
CA 90069

Northrop Computer Club
One Northrop Ave
1263/05
Hawthorne
CA 90250

Nereid Systems, Inc
2417 John St
Manhattan Beach
CA 90266

TRW Apple Users Group
M5-2565
1 Space Park
Redondo Beach
CA 90278

Original Apple Corps
15 Paloma Ave
#24
Venice
CA 90291

Citicorp Apple Users Group
3100 Ocean Park Blvd
M/S V6
Santa Monica
CA 90405

Apple Jacks
4818 Reese Road
Torrance
CA 90505

South Bay Apple Computer Club
P.O. Box 5201
Torrance
CA 90510

Oily Apples
3021 Copa De Oro
Los Alamitos
CA 90720

Mesa Apple Computer Club
21111 Dolores
146/8
Carson
CA 90745

Apple Electrosystems
533 Bradoaks Ave
Monrovia
CA 91016

San Gabriel Valley Macintosh Users Group
P.O. Box 792
Sierra Madre
CA 91024

Pyrus Malis
3309 Sparr Blvd
Glendale
CA 91208

Lerc Aces
3711 La Crescenta Ave
Glendale
CA 91208

JPL Apple Computer Club
4238 Wiley Ln
La Crescenta
CA 91214

Tri-Net Work Apple Users Group
8041 Sadning
Camoga Park
CA 91304

Apple/Valley Computer Club
4900 Newcastle
Encino
CA 91316

Aerospace Apple User Group
28901 Lotusgarden Dr
Canyon Country
CA 91351

Rockwell Science Center Computer
P.O. Box 1085
Thousand Oaks
CA 91360

Apple PI
1033 Stoneshed Ct
Westlake Village
CA 91361

Conejo Valley Macintosh User Group
3637 Thousand Oaks Blvd
Westlake Village
CA 91362

Mac Valley Users Group
P.O. Box 4297
Burbank
CA 91503

Mac Mania
964 Nottingham Dr
Corona
CA 91720

East Valley Apple Club
315-C Diamond Bar Blvd
Diamond Bar
CA 91765

Mt. San Antonio College Library
1100 North Grand Ave
Walnut
CA 91789

San Diego Macintosh Users Group
P.O. Box 12561
La Jolla
CA 92037

Sandy Apple Press
P.O. Box 1860
Lakeside
CA 92040

Apricorn
7050 Convoy Ct
San Diego
CA 92111

San Diego Medical Apple Users
7920 Frost St
405
San Diego
CA 92123

San Diego Macintosh Users Group
P.O. Box 81444
San Diego
CA 92138

Mac Desert Users Group
36953 Haywood Ave
Barstow
CA 92311

Empire Macintosh User Group
33418 Rosemond
Yucaipa
CA 92399

Orange Apple Computer Club
25422 Trabucco Rd
El Toro
CA 92630

North Orange Computer Club
11121 Vinevale
Garden Grove
CA 92641

McDonnell Douglas Apple User
20262 Wind Cave Ln
Huntington Beach
CA 92646

Mac Orange
P.O. Box 2178
Huntington Beach
CA 92647

McDonnell Douglas Astronautics
5301 Bolsa Ave
Huntington Beach
CA 92647

Orange Apple MUG

17661 Falkirk Ln
Huntington Beach
CA 92649

Apple MUG

280 Hospital Circle
#202
Westminster
CA 92683

JPL Computer/Apple Club

24575 Spartan St
Mission Viejo
CA 92691

McDonnell Douglas Astro Apple

1668 Mt. Darwin Circle
Fountain Valley
CA 92708

HAC Apple Computer Group

417 Meadowbrook Pl
Anaheim
CA 92801

HFEA Apple Computer Users Group

417 Meqadowbrook Pl
Anaheim
CA 92801

South Orange County Computer Club

211 S State College
134
Anaheim
CA 92806

Ventura County Mac Club

1413 D S Victoria Ave
Ventura
CA 93003

Conejo/Ventura Mac Users Group

P.O. Box 7754
Oxnard
CA 93031

South Coast Mac Users Group

P.O. Box 2035
Goleta
CA 93118

Sequoia Computer Users

216 E Colonial Dr
Hanford
CA 93230

Apple BUG

4509 Millbrook Way
Bakersfield
CA 93309

Santa Barbara User Group

90 W Highway 246
Bueliton
CA 93427

SMAL Apple

223 S Broadway
Santa Maria
CA 93454

Ridgecrest Apple Group

Star Rt
P.O. Box 109E
Inyokern
CA 93527

Club Mac Of Monterey

P.O. Box 222515
Carmel
CA 93922

The Macintosh User Group

394-B Ricketts Rd
1290 Spruance Rd
Monterey
CA 93940

Naval Hobby Computer Club

593 Michelson Rd, #3
Monterey
CA 93940

The Peninsula Lisa Users Group

P.O. Box 626
Moss Beach
CA 94038

Lookheed Employees Apple Users

P.O. Box 3504
Sunnyvale
CA 94088

Pacific Bell MUG

370 Third St
Rm 753A
San Francisco
CA 94107

Bay Area Macintosh Users Group

2040 Polk St
Ste 340
San Francisco
CA 94109

Show Page Mac Users Group

2040 Polk St
Ste 340
San Francisco
CA 94109

Peninsula Lisa Users Group

c/o Computer Connection
214 California St
San Francisco
CA 94111

East Bay Macintosh Group

1515 Sloat Blvd
Ste 2
San Francisco
CA 94132

Mac West

1077 Vallejo
San Francisco
CA 94133

SPACE

P.O. Box 1257
Palo Alto
CA 94302

Stanford Mac Users Group

P.O. Box 508
Stanford
CA 94305

Diablo Valley Apple User Group

P.O. Box 5031
Concord
CA 94524

TUSAUG

805 Luz Ct
Danville
CA 94526

Cricket Townsend SPC-Apple

P.O. Box 8019
2749 Camino Del Re
Fremont
CA 94537

Abacus User Group

2850 Jennifer Dr
Castro Valley
CA 94546

Apple Creek

1815 Ygnacio Valley Rd
Walnut Creek
CA 94598

Berkeley Macintosh Users Group

1442-A Walnut Street
Ste. 153
Berkeley
CA 94709

San Francisco Apple Lisa Club

P.O. Box 538
Fairfax
CA 94930

North Coast Mac Users

503 Marylyn Circle
Petaluma
CA 94952

Apple Library Users Group

20740 Valley Green Dr
32AJ
Cupertino
CA 95014

Apple Computer

20525 Mariani Ave
M/S 23G
Cupertino
CA 95014

Association Of Apple 32 Users

P.O. Box 634
Santa Clara
CA 95052

Macintosh International Apple

908 George St
Santa Clara
CA 95054

Apple PIE

P.O. Box 2185
Santa Clara
CA 95055

Santa Cruz Apple Group

P.O. Box 1428
Santa Cruz
CA 95061

Apple Blossom User Group

6110 Camino Verde
Ste 7
San Jose
CA 95119

Stanislaus Apple User Group

P.O. Box 741
Modesto
CA 95353

Sequoia Macintosh Users Group

P.O. Box 4623
Arcata
CA 95521

AMUG

11517 F Ave
Auburn
CA 9560

Davis Apple User Group

P.O. Box 1534
Davis
CA 95617

Roseville Apple Core

P.O. Box 1377
Roseville
CA 95661

Apple Sac

P.O. Box 254645
Sacramento
CA 95825

Sacramento Macintosh Users Group

P.O. Box 60908
Sacramento
CA 95860

COLORADO**Apple Three Users Group**

6818 S Magnolia Ct
Englewood
CO 80112

Apple Pi Users Group

P.O. Box 17467
Denver
CO 80217

Colorado Apple Users

P.O. Box 24869
Denver
CO 80224

Boulder Macintosh Meeting

NCAR
Boulder
CO 80302

Club Mac

735 Walnut
Boulder
CO 80302

CAAE

165 Iroquois Dr
Boulder
CO 80303

Greeley Outpost Club Mac

1955 23rd Ave
Greeley
CO 80631

South Colorado Apple Users

311 N Main
Pueblo
CO 81005

Apple Seeds
13579 6700 Rd
Montrose
CO 81401

CONNECTICUT

HUGE Apple Club
P.O. Box 18027
E Hartford
CT 06118

Southeast Connecticut Apple User Group
P.O. Box 510
Gales Ferry
CT 06335

Southern Connecticut Mac User
269 Thames St
Groton
CT 06340

Applefield Users Group
c/o Computerland
565 Longhill Rd
Bristol
CT 06340

Applelist
50 Ida Ln
West Haven
CT 06516

Vale Mac Users Group
P.O. Box 220
Yale Station
New Haven
CT 06520

Applelist
P.O. Box 8235
New Haven
CT 06530

East School
Hogan Dr
Torrington
CT 06790

Apple MUGS
345 Main St
Norwalk
CT 06851

Apple Share
37 Sturges Commons
Westport
CT 06880

Apple MUGS
7 Old Wagon Rd
Wilton
CT 06897

DELEWARE

P.O. Box 8904
Newark
DE 19711

Macintosh Users Of Delaware
P.O. Box 161
Rockland
DE 19732

FLORIDA

Daytona Beach Apple Users Group
P.O. Box 9596
Daytona Beach
FL 32020

Applejax
1021 King St
Jacksonville
FL 32204

North Florida Macintosh
P.O. Box 10286
Jacksonville
FL 32247

Pensacola Apple Data Association
P.O. Box 15048
Pensacola
FL 32514

Macintosh Users Group
924 Holbrook
Fort Walton Beach
FL 32548

Apple Users Core
307 Tarpon Rd
Mary Esther
FL 32569

Suffolk Apple Computer Society
506 Greenwood Cove South
Niceville
FL 32578

Honeywell Apple Corps
13350 US Highway 19 S
Clearwater
FL 32708

Apple Tree Of Central Florida
118 Margo Ln
Longwood
FL 32750

Valencia Community College
P.O. Box 3028
Orlando
FL 32802

O-Mac
3716 Ridgemont Rd
Orlando
FL 32808

Apple Pi Of Breward
P.O. Box 327
Melbourne
FL 32901

Space Coast Apple User Group
P.O. Box 2112
Merritt Island
FL 32952

A.C.E.S.
P.O. Box 9222
Coral Springs
FL 33065

Miami Apple User Group
3250 Mary St
Suite 305
Miami
FL 33133

MIAUG
5701 Collins Ave 1709
Miami Beach
FL 33140

MAUG
2300 NW 135 St
Miami
FL 33167

SMAUG
10201 Fontainebleu
Miami
FL 33172

Gold Coast Mac User Group
P.O. Box 26270
Fort Lauderdale
FL 33320

Aces
P.O. Box 291557
Fort Lauderdale
FL 33329

Viewtron Apple Expert
2786 Tennis Club Dr
#305
West Palm Beach
FL 33409

San Coast Apple Club
762 Oakview Dr
Bradenton
FL 33507

Scat
P.O. Box 7488
Clearwater
FL 33518

Polk Apple Core
P.O. Box 1562
Lakeland
FL 33801

Magic
408 Somerset Ave
Sarasota
FL 34243

GEORGIA

Sea
3258 Powers Ferry Rd
Marietta
GA 30067

La MUG
824 Azalea Dr
La Grange
GA 30240

Widget Apple Group
1914 Plantation Rd
Lawrence
GA 30245

Atlanta Area Apple Users Group
365 Arizona Avenue NE
Atlanta
GA 30307

Mac Users Group of Athens
175 Baxter Dr
1-2
Athens
GA 30606

Classic Apple Users Group
170 Holly Ln
Athens
GA 30606

Amigos
P.O. Box 301
Fort Valley
GA 31030

Savannah Macintosh Users Group
13 Cutler Ct
Savannah
GA 31419

HAWAII

H.A.U.S.
P.O. Box 91
Honolulu
HI 96810

Hawaii Macintosh Users Group
P.O. Box 75537
Honolulu
HI 96836

IDAHO

Apple User Group 1824-B Main St
Lewiston
ID 83501

A.B.U.G.
2213 Targee
#5
Boise
ID 83705

ILLINOIS

NIAUG
105 S Ridge Ave
Arlington Heights
IL 60005

Apple People
P.O. 333
224 N Main St
Crystal Lake
IL 60014

Apples Franks & Friends
33453 Greentree Rd
Wildwood
IL 60030

Searle Apple User Group
4901 Searle Pkwy
Skokie
IL 60077

W.A.U.G.
P.O. Box 8913
Waukegan
IL 60079

Plato Center Apple Users Group
Rt 2
Box 189
Elgin
IL 60120

Northwestern-Mouse User Group

627 Dartmouth Pl
Evanston
IL 60201

Aesop

820 Bonnie Brae
River Forest
IL 60305

Apple Tree Computer Club

1544 Edgewood Ave
Chicago Heights
IL 60411

Illinois Macintosh Users Group

2314 Mason St
Joliet
IL 60435

Lasalle County Station Apple User Group

1336 Liberty St
Morris
IL 60450

Aurora Area Apple Core

926 Britta Ln
Batavia
IL 60510

Dupage Apple User Group

Box 294
Downers Grove
IL 60515

Bell Laboratories

6C-320 Warrenville-Naperville
Naperville
IL 60566

American Bar Association

30 North La Salle
#3524
Chicago
IL 60602

The Rest of Us, The Chicago Area Macintosh User Group

134 N Lasalle 1100
Chicago
IL 60602

American Bar Association

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Apple IIc	<input type="checkbox"/> 202	<input type="checkbox"/> 203
Apple IIe	<input type="checkbox"/> 204	<input type="checkbox"/> 205
Apple III	<input type="checkbox"/> 206	<input type="checkbox"/> 207
Macintosh	<input type="checkbox"/> 208	<input type="checkbox"/> 209
Lisa	<input type="checkbox"/> 210	<input type="checkbox"/> 211
Other _____	<input type="checkbox"/> 212	<input type="checkbox"/> 213

(please specify)

2. Where do you usually use your Apple computer?

At home/home office	<input type="checkbox"/> 214
At a business office	<input type="checkbox"/> 215
Both office and home	<input type="checkbox"/> 216
In the classroom	<input type="checkbox"/> 217
Other _____	

218

3. Do you plan to purchase a personal computer in the next 12 months?

Yes	<input type="checkbox"/> 219
No	<input type="checkbox"/> 220
Don't know	<input type="checkbox"/> 221

4. Do you plan to purchase software in the next 12 months?

Yes	<input type="checkbox"/> 222
No	<input type="checkbox"/> 223
Don't know	<input type="checkbox"/> 224

5. Which of the following peripherals do you own or use? (check all that apply)

Disk Drive	<input type="checkbox"/> 225
Joystick (or game peripheral)	<input type="checkbox"/> 226
Modem	<input type="checkbox"/> 227
Monitor	<input type="checkbox"/> 228
Printer	<input type="checkbox"/> 229
Other (please specify) _____	

230

6. Which of the following peripherals do you plan to purchase in the next 12 months? (check all that apply)

Disk Drive	<input type="checkbox"/> 231
Joystick (or game peripheral)	<input type="checkbox"/> 232
Modem	<input type="checkbox"/> 233
Monitor	<input type="checkbox"/> 234
Printer	<input type="checkbox"/> 235
Other (please specify) _____	

236

7. Approximately how much do you plan to spend on your computer or computer-related items in the next 12 months?

Under \$100	<input type="checkbox"/> 237
100-499	<input type="checkbox"/> 238
500-999	<input type="checkbox"/> 239
1000-1999	<input type="checkbox"/> 240
2000 or over	<input type="checkbox"/> 241
Don't know	<input type="checkbox"/> 242

8. Please put an X in the box which indicates your age group.

Under 18	<input type="checkbox"/> 243
18-29	<input type="checkbox"/> 244
30-44	<input type="checkbox"/> 245
45-65	<input type="checkbox"/> 246
Over 65	<input type="checkbox"/> 247

9. What is the highest level you completed in school?

Some high school or less	<input type="checkbox"/> 248
High school graduate	<input type="checkbox"/> 249
Attended college 1-3 years	<input type="checkbox"/> 250
College graduate	<input type="checkbox"/> 251
Post-graduate study without degree	<input type="checkbox"/> 252
Master's degree	<input type="checkbox"/> 253
Doctoral degree	<input type="checkbox"/> 254

10. Would you describe your present occupation as

Student	<input type="checkbox"/> 255
Manufacturing/service	<input type="checkbox"/> 256
Clerical/technical	<input type="checkbox"/> 257
Sales	<input type="checkbox"/> 258
Educator	<input type="checkbox"/> 259
Professional	<input type="checkbox"/> 260
Other	<input type="checkbox"/> 261

11. What is the total combined annual income before taxes for all members of your household?

Less than \$10,000	<input type="checkbox"/> 262
10,000 to 14,999	<input type="checkbox"/> 263
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A Printer For All Reasons

Search For The Best High Quality Graphic Printer

If you have been looking very long, you have probably discovered that there are just too many claims and counter claims in the printer market today. There are printers that have some of the features you want but do not have others. Some features you probably don't care about, others are vitally important to you. We understand. In fact, not long ago, we were in the same position. Deluged by claims and counter claims. Overburdened by rows and rows of specifications, we decided to separate all the facts — prove or disprove all the claims to our own satisfaction. So we bought printers. We bought samples of all the major brands and tested them.

Our Objective Was Simple

We wanted to find that printer which had all the features you could want and yet be sold directly to you at the lowest price. We didn't want a "close-out special" of an obsolete product that some manufacturer was dumping, so we limited our search to only those new printers that had the latest proven technology. We wanted to give our customers the **best** printer on the market today at a bargain price.

The Results Are In

The search is over. We have reduced the field to a single printer that meets all our goals (and more). The printer is the SP-1000 from Seiko-sha, a division of Seiko (one of the foremost manufacturers in the world). We ran this printer through our battery of tests and it came out shining. This printer *can* do it all. Standard draft printing at a respectable 100 characters per second, and with a very readable 12 (horizontal) by 9 (vertical) character matrix. This is a full bi-directional, logic seeking, true descender printer.

"NLQ" Mode

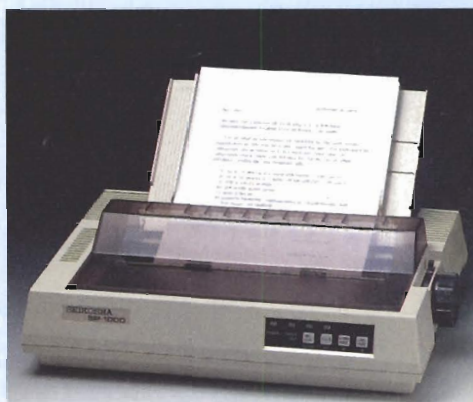
One of our highest concerns was about print quality and readability. The SP-1000 has a print mode termed Near Letter Quality printing (NLQ mode). This is where the SP-1000 outshines all the competition. Hands down! The character matrix in NLQ mode is a very dense 24 (horizontal) by 18 (vertical). This equates to 41,472 addressable dots per square inch. Now we're talking *quality* printing. It looks like it was done on a typewriter. You can even print graphics using the standard graphics symbols built into your computer. The results are the best we've ever seen. The only other printers currently available having resolution this high go for hundreds more.

Features That Won't Quit

With the SP-1000 your computer can now print 40, 48, 68, 80, 96, or 136 characters per line. You can print in ANY of scores of styles including double width and reversed (white on black) styles. You not only have the standard Pica, Elite, Condensed and Italics, but also true Superscripts and Subscripts. Never again will you have to worry about how to print H₂O or X². This fantastic machine will do it

automatically, through easy commands right from your keyboard. Do you sometimes want to emphasize a word? It's easy, just use **bold** (double strike) or use *italics* to make the words stand out. Or, if you wish to be even more emphatic, underline the words. You can combine many of these modes and styles to make the variation almost endless. Do you want to express something that you can't do with words? Use graphics with your text — even on the same line. You have variable line spacing of 1 line per inch to infinity (no space at all) and 143 other software selectable settings in between. You can control line spacing on a dot-by-dot basis. If you've ever had a letter or other document that was just a few lines too long to fit a page, you can see how handy this feature is. Simply reduce the line spacing slightly and ... VOILA! The letter now fits on one page.

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Consistent Print Quality

Most printers have a ribbon cartridge or a single spool ribbon which gives nice dark

printing when new, but quickly starts to fade. To keep the printers output looking consistently dark, the ribbons must be changed quite often. The SP-1000 solves this problem by using a wide (½") ribbon cartridge that will print thousands of pages before needing replacement. (When you finally do wear out your ribbon, replacement cost is only \$11.00. Order #2001.)

The Best Part

When shopping for a printer with this quality and these features, you could expect to pay much more. *Not now!* We sell this fantastic printer for **only \$239.95!** You need **absolutely nothing else to start printing** — just add paper (single sheet or fanfold tractor).

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